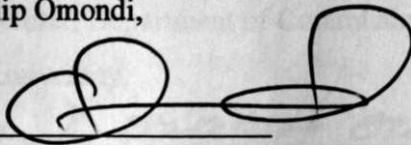


DECLARATION

I, Dr Maxwell Philip Omondi, declare that this dissertation is my original work and that it has not been presented in any other university for the purpose of obtaining a degree.

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Date:

APPROVAL

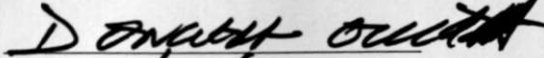
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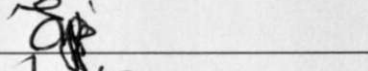
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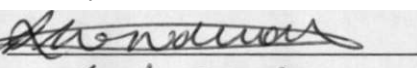
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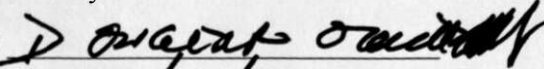
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TABLE OF CONTENTS

TABLE OF CONTENTS.....	5
LIST OF TABLES.....	7
ACRONYMS.....	9
DEFINATION OF TERMS.....	11
ABSTRACT.....	13
CHAPTER 1: INTRODUCTION AND BACKGROUND.....	15
1.0 Introduction.....	15
1.1 Background.....	16
CHAPTER 2: LITERATURE REVIEW.....	28
2.0 HIV in women and children.....	28
2.1 Clinical course of HIV in children.....	28
2.2 Anti-retroviral drugs in the prevention of mother to child transmission of HIV.....	29
2.3 Preventing breast milk transmission of HIV.....	32
2.4 World Health Organization guidelines on HIV and Infant Feeding.....	32
2.5 International and Local experience in delivery of PMCT services.....	32
2.6 Challenges to delivery of PMCT services.....	35
CHAPTER 3: STATEMENT OF THE PROBLEM.....	38
3.0 Problem statement.....	38
3.1 Justification of the study.....	39
3.2 Conceptual framework.....	40
3.3 Objectives.....	41
3.4 Hypothesis.....	41
CHAPTER 4: METHODOLOGY.....	42
4.0 Study design.....	42
4.1 Study area.....	42
4.2 Study population.....	45
4.3 Study variables.....	45
4.4 Sample size and Sampling procedure.....	46
4.5 Data collection techniques and instruments.....	48
4.6 Data processing and analysis.....	51
4.7 Minimization of errors and biases.....	52
4.8 Ethical considerations.....	52
4.9 Study limitations.....	53

CHAPTER 5 STUDY FINDINGS.....	54
5.1 Socio-demographic characteristics of the sample population	54
5.2 Quality of PMTCT counseling services.....	57
5.3 Quality of PMTCT services.	68
5.4 Level of awareness of HIV positive pregnant women on the use of ARV prophylaxis.....	73
5.5 ARV prophylaxis uptake.....	75
5.6 Results of PMTCT Providers.....	80
5.7 Qualitative analysis.....	82
CHAPTER 6: DISCUSSION.....	84
6.1 Socio-demographic characteristics	84
6.2 Quality of PMTCT counseling services.....	86
6.3 Level of awareness of HIV positive pregnant women on the use of ARV prophylaxis.....	88
6.4 ARV prophylaxis uptake.....	89
6.5 PMTCT providers' training and experience, knowledge and attitude.....	91
CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS.....	93
7.1 CONCLUSIONS.....	93
7.2 RECOMMENDATIONS.....	95
REFERENCES.....	96
APPENDICES.....	105

LIST OF TABLES

Table 1: Estimated magnitude of MTCT in Kenya, 2007.....	18
Table 2: Risk factors for MTCT of HIV.....	21
Table 3: Demographic profile for Kakamega district.....	43
Table 4: Catchment populations per facility.....	44
Table 5: Socio-demographic characteristics of the HIV positive pregnant women respondents (n=119).....	54
Table 6: Characteristics of the health care workers and health facilities (n=30).....	56
Table 7: The quality of PMTCT counseling services (n=119).....	61
Table 8: Results of bivariate analysis of the relationship between socio-demographic, quality of pmtct counseling and the maternal ARV prophylaxis uptake.....	62
Table 9: Results of bivariate analysis of the relationship between socio-demographic, quality of pmtct counseling and the infant ARV prophylaxis uptake.....	65
Table 10: The results of the logistic regression of the possible predictors for maternal ARV prophylaxis uptake.....	68
Table 11: The proportion of positive responses from 30 PMTCT counselors interviewed (n=30).....	68
Table 12: The ratings of quality of pmtct services per categories and the overall quality of PMTCT services from assessments done in the 30 health facilities (n=30).....	72
Table 13: The results of the logistic regression of the possible predictors for infant ARV prophylaxis uptake.....	73
Table 14: Results of the logistic regression of the possible predictors for maternal ARV prophylaxis uptake with regard to level of awareness on ARV prophylaxis.....	78
Table 15: Results of the logistic regression of the possible predictors for maternal ARV prophylaxis uptake with regard to level of awareness on ARV prophylaxis.....	80

LIST OF FIGURES

Figure 1: HIV outcomes of infants born to ARV naive infected pregnant women.....	19
Figure 2: Scale up of PMTCT sites in Kenya	40
Figure 3: The number of pregnant women counseled and tested in Kenya	25
Figure 4: The number of HIV positive pregnant women given maternal ARV prophylaxis in Kenya	26
Figure 5: Conceptual framework on ARV prophylaxis uptake.....	40
Figure 6: Diagrammatic representation of the multi-stage sampling of health facilities.....	48
Figure 7: The quality of PMTCT counseling services.....	61
Figure 8: Percentage on knowledge of respondents on the use of ARVs for PMTCT.....	74
Figure 9: Percentage on knowledge of respondents on when to use ARVs for PMTCT.....	75
Figure 10: Percentage on knowledge of respondents on when to use ARVs for HIV exposed babies	75
Figure 11(a): Maternal and infant ARV prophylaxis uptake for Jan-March 2009 period.....	76
Figure 11 (b). Maternal and infant ARV prophylaxis uptake for Jan-March 2009 period.....	77
Figure 12: Ratings in percentage of maternal ARV prophylaxis uptake, Jan-March 2009.....	78
Figure 13: Ratings in percentage of infant ARV prophylaxis uptake, Jan-March 2009.....	79
Figure 14: Percentage of PMTCT providers trained and experienced.....	80
Figure 15: Percentage of level of knowledge of PMTCT providers on PMTCT.....	81
Figure 16: Attitude of the PMTCT providers	82

ACRONYMS

ACTG	AIDS Clinical Trial Group
ANOVA	Analysis of Variance
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Clinic
ART	Anti-retroviral Therapy
ARVs	Anti-retrovirals
ARV	Antiretroviral drugs
CDC	Center for Disease Control
CD4	Cluster of differentiation 4
CORPs	Community Owned Resource Persons
CTA	Call To Action
DASCO	District HIV/AIDS/STI Control Council
DMLTs	District Medical Laboratory Technologists
DHMT	District Health Medical Team
DNA	Deoxyribonucleic acid
DRC	Democratic Republic of Congo
FHI	Family Health International
FP	Family Planning
HAART	Highly active antiretroviral therapy
HCWs	Health Care Workers
HCT	HIV Counseling and Testing
HIV	Human Immunodeficiency Virus
IEC	Information, Education and Communication
KAIS	Kenya AIDS Indicator Survey
KDHS	Kenya Demographic Health Survey
KEMSA	Kenya Medical Supplies Agency
NACC	National AIDS Control Council
NARESA	Network of AIDS Researchers in Eastern and Southern Africa
NASCOP	National AIDS and STI control programme
NIAID	National Institute of Allergy and Infectious Diseases
MCH	Maternal Child Health
MTCT	Mother to Child transmission of HIV

MTCTP	Mother to Child HIV transmission Prevention
MOH	Ministry of Health
OIs	Opportunistic Infections
OVC	Orphans and Vulnerable Children
PARTO	Provincial Antiretroviral Officer
PATH	Program for Appropriate Technology in Health
PASCO	Provincial HIV/AIDS/STI Control Council
PCR	Polymerase Chain Reaction
PCP	Pneumocystis Carinii pneumonia
PMTCT	Prevention of Mother to Child Transmission of HIV
PEPFAR	President's Emergency Plan For AIDS Relief
PMTCT	Prevention of Mother to child transmission of HIV
RH	Reproductive Health
RNA	Ribonucleic acid
RTI	Respiratory Tract Infections
sd-NVP	single dose Nevirapine
STI	Sexually Transmitted Infections
SPSS	Statistical Package for Social Sciences
TB	• Tuberculosis
TWG	Technical Working Group
UNAIDS	Joint United United Nations Programme on HIV/AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
UNICEF	United Nations Children's Fund
US	United States
USAID	United States Assistance for International Development
U5MR	Under 5 mortality rate
WHO	World Health Organization
VCT	Voluntary Counseling and Testing

DEFINATION OF TERMS

INSTITUTIONAL FACTORS

This refers to factors within the health facility that affects the uptake of ARV prophylaxis amongst HIV positive pregnant women.

HIV

Human immunodeficiency virus (HIV) is a retrovirus that can lead to *acquired immunodeficiency syndrome* (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections.

Acquired immunodeficiency syndrome (AIDS)

Active pathological condition that follows the earlier, non-symptomatic state of being HIV positive.

Mother-to-child transmission of HIV

HIV transmission to child from HIV-infected woman which can occur during pregnancy, delivery or breastfeeding period.

PMTCT

PMTCT refers to prevention of mother-to-child transmission. Is a commonly used term for programmes and interventions designed to reduce the risk of mother-to-child transmission of HIV.

ARV

ARV stands for anti-retroviral drugs. Antiretroviral drugs are medications for the treatment of infection by retroviruses, primarily HIV.

ARV PROPHYLAXIS

ARV prophylaxis refers to short-term use of antiretroviral drugs to reduce HIV transmission from mother to infant.

QUALITY

Objectively, quality is defined as the degree of compliance of a process or its outcome with a predetermined set of criteria, which are presumed essential to the ultimate value it provides.

Subjectively it is defined as the level of perceived value reported by the person who benefits from a process or its outcome.

QUALITY OF SUPER VISION

Quality of PMTCT supervision is a process of guiding, helping, training and encouraging staff to improve their performance to provide high quality health services.

ATTITUDE

Attitude is a hypothetical construct that represents an individual's like or dislike for an item. It's a complex mental state involving beliefs, feelings, values, experiences and dispositions to act in certain ways.

AWARENESS

Awareness comprises human's perception and cognitive reaction to a condition or event. Awareness does not necessarily imply understanding, just an ability to be conscious of, feel or perceive.

PHARMACY SUPPORT

Pharmacy is the health profession that links the health sciences with the chemical sciences and is charged with ensuring the safe use of medication. Pharmacy support will include availability of ARV drugs for the prophylaxis as well as supervision and mentoring the staff on ARV commodity management to ensure no stock outs.

ABSTRACT

Background: Mother to child transmission of HIV/AIDS accounts to almost 90% of HIV infections in children. ARV prophylaxis is one of the key interventions in the prevention of mother to child transmission of HIV and its goal is to reduce the HIV transmission from a HIV infected pregnant woman to the child during pregnancy, childbirth and breastfeeding. National PMTCT programme is facing many challenges and key amongst them is the low uptake of ARV prophylaxis. Failure to use ARV prophylaxis leads to more HIV transmission from mother to child ante-natally, intra-partum and postpartum. Many factors affect the uptake of ARV prophylaxis amongst HIV positive pregnant women and these include client as well as institutional factors.

Objectives: The study looked at the relationship between institutional factors and the uptake of ARVs in PMTCT programme in Kakamega district.

Methods: A descriptive study design was used and sampling was done using a combination of both convenient sampling and multi-stage sampling method. Qualitative and quantitative methods of data collection were used and methodological triangulation was also used to determine the institutional barriers to uptake of ARV prophylaxis. Statistical tests were used to determine independent predictors of uptake of prophylactic ARVs.

Results: The study revealed that urban health facilities were almost 3 times more likely to be rated as having a satisfactory maternal ARV prophylaxis as compared to the rural health facilities ($p=0.039$). After controlling for confounders the only characteristics that remained strong predictors to either maternal or infant ARV prophylaxis uptake were district, facility, type of health facility, age and risk reduction.

Risk reduction was 6 times more likely to be discussed in health facilities rated as having satisfactory maternal ARV prophylaxis as compared to health facilities rated as having unsatisfactory maternal ARV prophylaxis uptake (Fisher's exact Test= 0.039). More HIV positive pregnant women are more likely to have disclosure of HIV status to partner discussed in health facilities with satisfactory maternal ARV prophylaxis uptake compared to health facilities with unsatisfactory maternal ARV prophylaxis uptake (Fisher's Exact test= 0.009). There was high quality of PMTCT services with 86.7% of the health facilities sampled having satisfactory quality of PMTCT services. In this study majority 95% of the HIV positive pregnant women knew that HIV can be transmitted from HIV positive pregnant woman to the child.

The study showed that most 82.3% of the HIV pregnant women knew that antiretroviral drugs can be used for prevention of mother to child transmission of HIV. The mean maternal and infant ARV prophylaxis was 87.5% and 77% respectively for the Jan-March 2009 period. It further showed 90% of the PMTCT counselors' were PMTCT trained and were providing PMTCT services. The PMTCT mean score on a 20-item knowledge test was 77.17% correct (95% CI: 73.28-81.05%). The attitude scores ranged from 39% to 91% with a mean of 62.13% (95% CI: 57.53-66.73%).

Conclusion: This study showed the quality of PMTCT counseling was good though there was need to have the counselors emphasize on risk reduction, HIV disclosure issues as well as condom demonstration and use.

Recommendations: PMTCT counselors need to be re-oriented on the importance of offering quality PMTCT counseling services. They should ensure all aspects of pre-test and post-test counseling are discussed with the pregnant women including issues on HIV disclosure to partners, risk reduction and condom demonstration and condom use. The administration of maternal and infant ARV prophylactic regimens should be done at the same time, same day to avoid scenarios where infant ARV prophylaxis uptake is lower than the maternal ARV prophylaxis uptake. A similar study needs to be carried out in a different geographical and socio-cultural set up to identify other factors that could affect maternal and infant ARV prophylaxis uptake.

CHAPTER 1: INTRODUCTION AND BACKGROUND

1.0 INTRODUCTION

Human immunodeficiency virus (HIV), the virus that causes Acquired Immune Deficiency Syndrome (AIDS) has become a household name in most countries in sub-Saharan Africa. About 90% new pediatric HIV infections occur through mother to child transmission of HIV (UNAIDS 2009). Therefore, interventions aimed at preventing mother to child transmission of HIV remains critical in averting the number of new pediatric HIV infections. Indeed, the use of ARV prophylaxis has been recognized by Kenya National PMTCT programmes as one of the core PMTCT interventions. ARV prophylaxis entails short-term use of antiretroviral drugs to reduce HIV transmission from an HIV infected individual to an exposed individual. These include the prevention of mother to child transmission of HIV. Other uses of ARV prophylaxis are post-exposure prophylaxis (PEP) to prevent HIV infection after exposure from a HIV infected/suspected individual e.g. infants of HIV infected women or following sexual assaults or needle-stick injuries.

The uptake of ARV prophylaxis refers to the proportion of HIV infected pregnant women and therefore HIV exposed babies accessing antiretroviral drugs for PMTCT. About 90% of women who had a recent birth (within last 4 years) attended ANC (Kenya AIDS Indicator Survey, 2007). Therefore, antenatal clinics provide a window of opportunity to target mothers for PMTCT. Mobilizing the mothers to seek antenatal services at the earliest opportunity becomes a central theme of the communication strategy. The strategy should focus on increasing awareness, knowledge and motivation for mothers and fathers in seeking to know their HIV status.

Success of a PMTCT programme depends on many factors including; policy issues like ARV regimen in use and system of administration; socio-cultural factors like gender roles and male participation in PMTCT programmes, stigma, poverty; policy implementation and institutional factors. Institutional factors such as the quality of basic ANC/safe motherhood programmes, human resource issues like availability of trained staff, staff attitude, availability of ARVs, monitoring and evaluation issues (monitoring and documentation of interventions provided to HIV positive pregnant women to prevent mother to child transmission of HIV (MTCT) and quality of health facilities supervision and management play an important role in increasing uptake of ARV prophylaxis amongst HIV positive pregnant women.

The aim of this study was to assess the institutional factors affecting the uptake of ARV prophylaxis amongst HIV positive pregnant women in Kakamega district. The results of this study will be used to inform the PMTCT programme in Kakamega as well as the National PMTCT programme.

1.1 BACKGROUND

1.1.1 Historic perspective

The HIV/AIDS pandemic presents political, economic, public health, social and scientific challenges worldwide. HIV/AIDS cases have been reported in all regions of the world, but most people living with the disease reside in low- and middle-income countries, more so in sub Sahara Africa that carries 60% of the world's disease burden despite having only 10% of the world's population (UNAIDS 2009). The past few years have brought greater international attention to HIV/AIDS and funding for the disease, but the need is much greater. In July 1981, the New York Times reported an outbreak of a rare form of cancer among gay men in New York and California, first referred to as the "gay cancer"; but medically known as 'epidemic Kaposi Sarcoma.' About the same time, Emergency Rooms in New York City began to see a rash of seemingly healthy young men presenting with fevers, flu like symptoms, and a pneumonia called *Pneumocystis jirovecii* (previously known as *carinii*) pneumonia (PCP) a disease that typically affects severely immunosuppressed individuals (Mark 2009). About a year later, the Centers for Disease Control (CDC) linked the illness to blood and coined the term Acquired Immune Deficiency Syndrome (AIDS). In that first year over 1600 cases were diagnosed with close to 700 deaths. As the number of deaths soared, medical experts scrambled to find a cause and more importantly a cure. In 1984, Pasteur Institute of France discovered what they called the HTLV-1, but it wasn't until a year later that a US scientist, Dr. Robert Gallo confirmed it as the cause of AIDS (Mark 2009). The name HIV (human immune deficiency virus) was adopted later to facilitate communication. Following this discovery, the first test for HIV was approved in 1985. Over the next several years medications to combat the virus were developed as well as medicines to prevent infections that flourish when the immune system is damaged by HIV and AIDS. By the end of 1987, there were 71,000 confirmed cases of AIDS globally, resulting in over 40,000 deaths (Mark 2009). The epidemic continued to expand to involve heterosexuals, intravenous drug users, hemophiliacs and in 2008 it is estimated that close to 60 million people had been infected with HIV since the onset just over 25 years ago.

1.1.2 HIV in women and children

HIV is transmitted from person to person through the exchange of body fluids such as semen, vaginal secretions, breast milk and blood products. Sexual contact is the most common way of spreading HIV, but it can also be transmitted by sharing needles when injecting drugs, or during pregnancy, childbirth and breastfeeding. As HIV reproduces, it damages the body's immune system and the body becomes susceptible to illness and infection. To date, there is no known cure for HIV infection.

The impact of the HIV epidemic on child health is most marked in the region of sub Sahara Africa that carries 90% of pediatric infections and the twin epidemic of AIDS orphans, currently estimated to be ~ 14 million, again 90% living in the same region. With the burden of new infections falling on young women, there is a skyrocketing number of AIDS orphans, and a rapidly increasing number of children infected via mother-to-child-transmission (MTCT). In 2006 it was estimated that under-five child mortality rates (U5MR) would be more than double in countries such as Botswana, Kenya and Zimbabwe by the year 2010 if urgent action was not taken to prevent mother-to-child transmission of HIV (Philip *et al* 2006).

Reducing the incidence of HIV infections in children requires comprehensive intervention that incorporates the entire continuum of risk of infection. Efforts in this regard should include: preventing new infections in the general population, especially women of reproductive age, offering supportive family planning services to prevent unintended pregnancies among HIV infected women; providing interventions during pregnancy, labor and delivery and in the postnatal period with a special focus on infant feeding practices and providing HIV care and treatment services to the mothers of the HIV exposed children. Universal use of a relatively low efficacy intervention such as single-dose Nevirapine (sd-NVP) would reduce these infections by half. Unfortunately, globally universal access to PMTCT has not been achieved and even where services are available there is low uptake of ARV prophylaxis for PMTCT.

1.1.3 Magnitude of HIV/AIDS and PMCT in Kenya

The number of people living with HIV in Kenya stands at 1.3 million people and women above 15 years account for 740,000 of those living with HIV in Kenya while children (< 14 years) account for 150 000 living with HIV (UNAIDS Global Report 2006 Data). Furthermore, preliminary results of 2007 Kenya AIDS Indicator Survey (KAIS) indicate that 7.4% of adults age 15-64 are infected with HIV. This means that about 1.4 million adults are living with HIV in Kenya. A higher proportion of women aged 15-64 (8.7 percent) than men (5.6 percent) are infected with HIV (KAIS 2007). This means that 3 out of 5 HIV-infected Kenyans are female. In addition it also indicates that 5.1% of adult population in Western province is HIV-infected. Young women are particularly vulnerable to HIV infection compared with young men. For example among youth age 15-24, women are 4 times more likely to be infected than men (6.1 percent compared to 1.5 percent) (KAIS 2007).

Table 1: Estimated magnitude of MTCT in Kenya, 2007

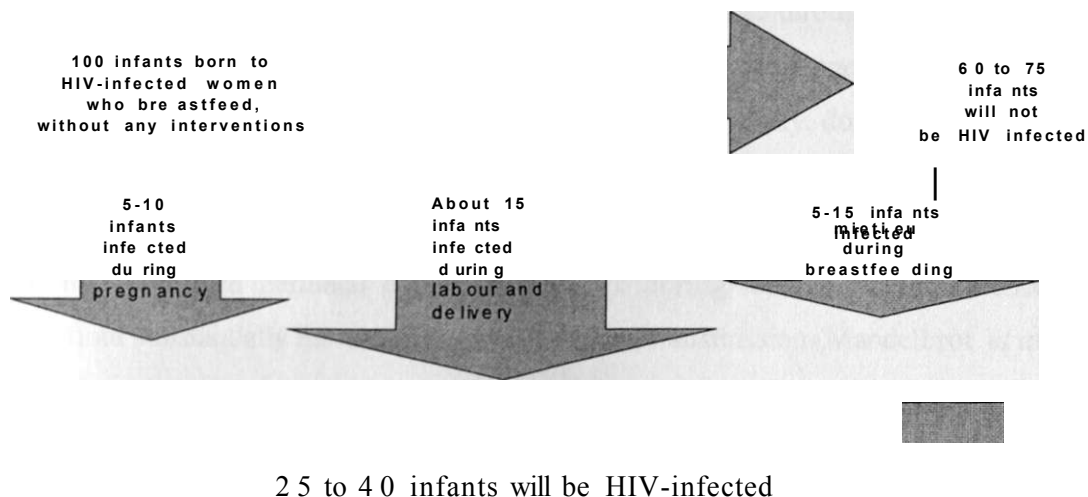
Population (Estimates 2007)	37.2million
Births per annum	1.73million
HIV prevalence in Mothers	6.7%
Total number of births to HIV-infected mothers exposed to MTCT assuming no multiple pregnancy	141,101
Number of HIV positive infants per annum in Kenya assuming 40% transmission	45,640

Source: Ministry of Health Guidelines for Prevention of Mother to Child Transmission (PMTCT) of HIV/AIDS in Kenya (3rd Edition, 2009).

National AIDS Control Council (NACC) 2005 identified that in 2004, 83,000 pregnant women were estimated to be HIV positive, and about 30,000 children were infected through mother-to-child transmission in Kenya. Current estimates are that there are 120,000 children living with HIV in Kenya. The vast majority (-80%) acquired HIV infection through mother-to-child transmission. The HIV epidemic in Kenya has resulted in a 30% increase in mortality among infants and young children. This means that one third of all infant deaths can now be attributed to AIDS. Thus the AIDS epidemic is rapidly reversing the gains in child survival accrued through decades of child survival programme effort.

1.1.3 Magnitude and risk of mother-to-child transmission of HIV

Figure 1: HIV outcomes of infants born to ARV naive infected pregnant women



Source: Kenya National PMTCT guideline, June 2005.

Without interventions, overall risk of MTCT of HIV is 25-40%. Clinical research shows that the risk of mother to child transmission of HIV is spread out during three critical phases. The first phase is during pregnancy (10-15%), the second phase is during labor and delivery (15-20%) and the third phase is during breastfeeding (15-20%). Figure 1 shows the HIV outcomes of infants born to women infected with HIV without interventions and Table 1 shows the maternal factors that may contribute to increase of HIV transmission from mother to child (Kenya National PMTCT guideline, June 2005).

1.1.5 Co-relates of PMTCT of HIV

1.1.5.1 Risk factors during pregnancy

Early *in utero* HIV infection is rare, and is thought to be more common towards the end of pregnancy. Major factors that have been associated with increased transmission include a high maternal virus load, decreased CD4+ count, lack of HIV neutralizing antibody, advanced clinical disease, primary infection, first-born twins, and obstetric factors including chorioamnionitis, mode of delivery and more than four hours of ruptured membranes before delivery (Bryson 1996, Sheldon *et al* 1996). Progressively, greater disturbances of vaginal flora, increase HIV acquisition during pregnancy (Taha *et al* 1998). Placental disruption by for example, chorioamnionitis, or through

cigarette smoking and illicit drug use, has been associated with increased transmission risk (Newell, Marie-Louise 1998).

1.1.5.2 Risk factors during delivery

Transmission during labor and delivery could occur via direct contact of the fetus/infant with infectious maternal blood and genital secretions during passage through the birth canal, through ascending infection from the vagina or cervix to the fetal membranes and amniotic fluid, and through absorption in the fetal-neonatal digestive tract. Alternatively, during uterine contractions in labor, maternal-fetal micro-transfusion may occur (Nielsen *et al* 1996). Long labor and prolonged membrane rupture may increase the risk of transmission, although this has not been found in all studies. In the French perinatal cohort, hemorrhage during labor and the presence of bloody amniotic fluid substantially increased the risk of vertical transmission (Mandelbrot *et al* 1999).

1.1.5.3 Risk factors in the postnatal period

Breastfeeding is important for the health of children and survival of young infants. Unfortunately breastfeeding contributes significantly to MTCT of HIV especially in the absence of ARV treatment or prophylaxis. Risk of MTCT transmission of HIV is 15-30% without breastfeeding, 25-35% with breastfeeding shortened to 6 months and 30-45% for women breastfeeding for a median of 18-24 months. In Kenya, the frequency of breast milk transmission of HIV-1 was 16.2% in the randomized clinical trial, and the majority of infections occurred early during breastfeeding. The use of breast milk substitutes prevented 44% of infant infections and was associated with significantly improved HIV-1-free survival in a highly selected population of ARV naive women (Nduati *et al* 2000).

Babies are at risk of breast milk transmission of HIV as long as they are breastfed. The estimated annual risk of late postnatal transmission of HIV after 2.5 months of age was 3.2 cases per 100 breastfed children born to HIV infected women (Confidence interval 3.1-3.8) in data collected before the use of ARV (Leroy *et al* 1999). HIV is present in breast milk, although the viral load concentrations in breast milk are significantly lower than those found in blood. Among women recently infected with HIV, the risk of transmission through breastfeeding is nearly twice as high as for women infected before or during pregnancy, because of high viral load shortly after initial infection (WHO/UNICEF/UNAIDS HIV and infant feeding Guidelines for decision-makers, 2003).

Table 2: Risk factors for Mother to Child transmission of HIV.

	Strong evidence	Limited evidence
<i>Viral</i>	High viral load	Viral resistance(theoretical possibility) Viral genotype and phenotype
<i>Maternal</i>	Immune deficiency(low CD4 count),HIV infection acquired during pregnancy or breastfeeding period	Vitamin A deficiency, anemia, sexually transmitted diseases, chorioamnionitis, frequent unprotected sexual intercourse, multiple sexual partners, smoking, injecting drug abuse
<i>Obstetric</i>	Vaginal delivery(compared to elective caesarean section),rupture of the membranes for more than 4 hours	Invasive or traumatic procedures: instrumental deliveries, amniocentesis, episiotomy, external cephalic version(ECV),etc, intrapartum hemorrhage
<i>Fetal/infant</i>	Prematurity	Lesions of skin and/or mucous membranes
<i>Breastfeeding</i>	Duration of breastfeeding, mixed feeding, breast disease(mastitis/cracked nipples)	Oral thrush (baby)

Source: Guidelines for Prevention of Mother to Child Transmission (PMTCT) of HIV/AIDS in Kenya (3rd Edition).

1.1.6 Implementation of PMCT by the Kenya Ministry of Health

1.1.6.1 Kenya Ministry of Health PMCT Program goals

The goal of the National PMTCT Program is in line with the goal set out at the United Nations General Assembly Special Session on HIV/AIDS (UNGASS) in 2001 to reduce the proportion of infants infected with HIV by 20% by 2005 and 50% by 2010. In Kenya, the National Program plans to extend PMTCT services to at least 20% of all health facilities by the end of 2005 and to at least 80% by 2007. This emphasizes on the use of the ARV prophylaxis as a key intervention area in reducing mother to child transmission of HIV. The importance of this is also captured in Kenya national PMTCT program goals which include:

1. 80% ANC women to have access to PMTCT services
2. 80% uptake HIV counseling and testing
3. 80% uptake of prophylactic ARV
4. 50% infant HIV infections averted by 2010.

Kenya's Ministry of Health (MoH), through NASCOP, has taken several actions to expand and strengthen PMTCT interventions in the country. In 2000, a National Technical Working Group (TWG) on PMTCT was formed. The TWG, co-chaired by NASCOP and the Division of Reproductive Health, coordinates implementation and provides technical support to the National PMTCT Programme. As new PMTCT projects begin, the TWG serves as a forum provide ongoing

review of guidelines, program implementation, update stakeholders and discuss challenges and upcoming activities.

1.1.6.2 Kenya Ministry of Health Guidelines for PMTCT

7. / 6.2.1 Framework for PMTCT Prevention

In order to meet the stated PMTCT goals, the Kenya Ministry of Health has adopted the global guidelines for prevention of MTCT transmission of HIV (Kenya National PMTCT guideline, June 2005). Modifications on the guidelines have been made to keep abreast as science reveals better ways of preventing MTCT of HIV. The broad framework is based on the four pillars of:

- a) Element 1: Primary prevention of HIV infection
- b) Element 2: Prevention of unintended pregnancies among women infected with HIV
- c) Element 3: Prevention of HIV transmission from women infected with HIV to their infants
- d) Element 4: Provision of treatment, care and support to women infected with HIV, their infants and their families

A fundamental concept in provision of PMTCT is the absolute requirement of integrating these interventions into the existing reproductive and child health services.

1.1.6.2.2 Specific interventions in the third pillar of PMTCT

The PMCT interventions that should be provided to pregnant women include:

1. Provider initiated HIV testing in the ANC and Maternity HIV testing;
2. ARV Prophylaxis: Standard minimum package;
3. Immunologic and clinical staging;
4. ARV prophylaxis according to the WHO 2006 guidance
 - Single dose Nevirapine, or
 - Combination ARV ^Nevirapine (NVP) and Zidovudine (AZT)j^ - used in limited settings
 - HAART where feasible and women meet national eligibility criteria.
5. Infant feeding counseling;
6. Co-trimoxazole prophylaxis;
7. Multivitamins and nutrition counseling;
8. Screening for TB and other OI's;
9. INH prophylaxis when indicated;
10. Treatment of OI's;
11. Psychosocial support;
12. Postnatal follow-up of mother-infant pair.

ARV prophylaxis is one of the key interventions for the pregnant HIV infected woman. To date the most widely used anti-retroviral (ARV) prophylaxis for the mother and infant is sd NVP as prescribed by the HIV NET 012 trial. Nevirapine is given as 200mg STAT for the mother at onset of labor and 2mg/kg for the baby within 72 hours of life/birth. New evidence of more efficacious short course regimens and emergence of NVP resistance has led to the use of combination prophylactic ARV's such as AZT and NVP.

1.1.6.3 PMTCT Program Indicators

In order to gauge the progress in up-scaling of PMTCT services several indicators have been developed globally and at program implementation level. The 2001 UNGASS Declaration of Commitment on HIV/AIDS have stated the PMCTC indicators used to determine program as:

- (1) HIV counseling and testing- Number of pregnant women giving birth, receiving ANC, testing and counseling for HIV;
- (2) ARV prophylaxis for women and infants.

In order to reduce the number of HIV infected babies by 20% in 2005 and 50% in 2010, 80% of pregnant women will need to access a package of PMTCT services that include antenatal care, counseling and other HIV prevention services that included anti-retroviral therapy for prevention and treatment. Where appropriate, breast milk substitutes and the continuum of care should be provided.

The President's Emergency Fund (PEPFAR), the US Government gift to most affected countries in Africa and which currently supports -70% of the PMTCT activities provided additional indicators for monitoring PMTCT services. PEPFAR indicators reference guide 2007 outlines the PMTCT programme indicators as follows:

1. Number of service outlets providing the minimum package of PMTCT services according to national and international standards;
2. Number of pregnant women who received HIV counseling and testing for PMTCT and received their test results;
3. Number of pregnant women provided with a complete course of antiretroviral prophylaxis in a PMTCT setting;
4. Number of health workers trained in the provision of PMTCT services according to national and international standards.

The Kenya government indicators that are derived from the programme goals for PMTCT that have been presented earlier which stipulates that 80% of ANC women to have access to PMTCT services, 80% uptake HIV counseling and testing, 80% uptake of prophylactic ARV and 50% infant HIV infections are averted by 2010 (KNASP II).

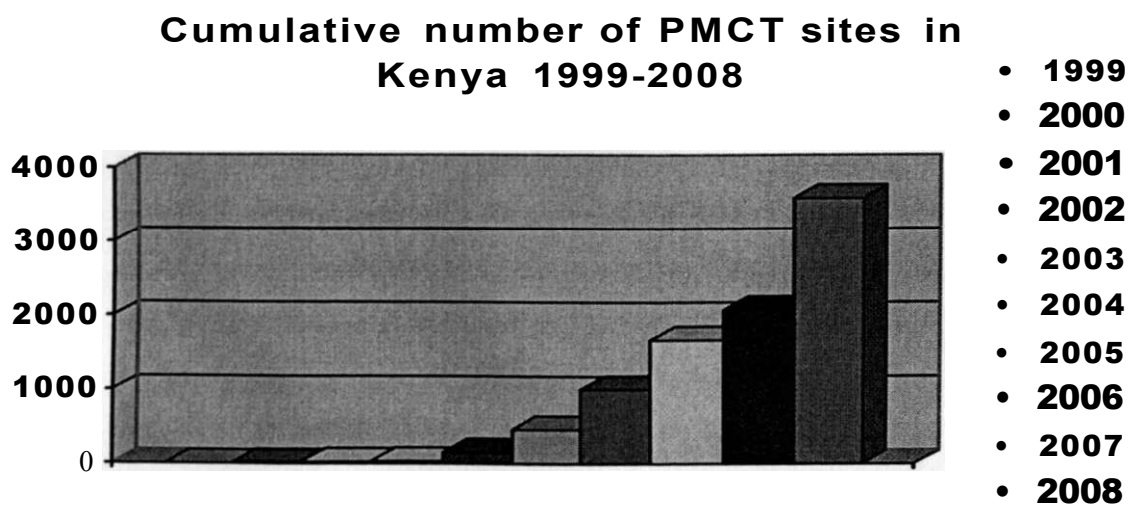
1.1.6.4 Progress in provision of PMCT services

1.1.6.4.1 Pilot sites

In 1999-2001, Government through NASCOP and its development partners (UNICEF, Horizons Project of Population Council and NARESA and FHI) established 5 pilot PMTCT sites that evaluated then available interventions AZT from 34 weeks, replacement feeding and sd NVP for women identified late in pregnancy. Based on these early experiences, the National scale-up was initiated in 2002 with sdNVP as the backbone intervention. The National PMTCT programme was officially launched in 2002 with the introduction of the National Guidelines on the Prevention of Mother to Child Transmission of HIV, with support from partner organizations and in 2003 the National PMTCT Strategic plan (2003-2007) was developed. Since then progress made in increasing the number of health facilities providing PMTCT services, as well as maternal counseling and testing, as well as ARV prophylaxis.

Up-scaled Access to services

Figure 2: The scale up of PMTCT sites in Kenya.



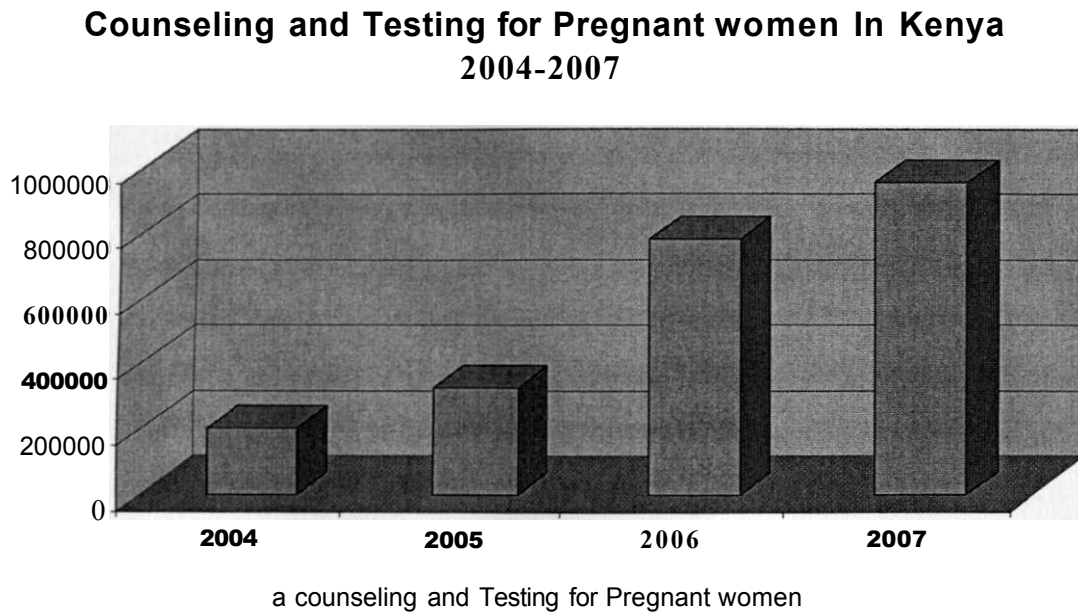
Source: US AID Kenya report, 2008.

The number of PMTCT sites have grown steadily from (eleven) 11 sites in 2000 to (two thousand and eighty) 2080 sites in 2007 as shown in Figure 2. In 2007, well over 800,000 pregnant women accessed PMCTC services in Kenya.

1.1.6.4.3 Uptake of counselling and testing by pregnant women

The number of pregnant women counselled and tested has been increasing gradually from 203,091 in 2004 to 954,161 in 2007 as shown in Figure 3.

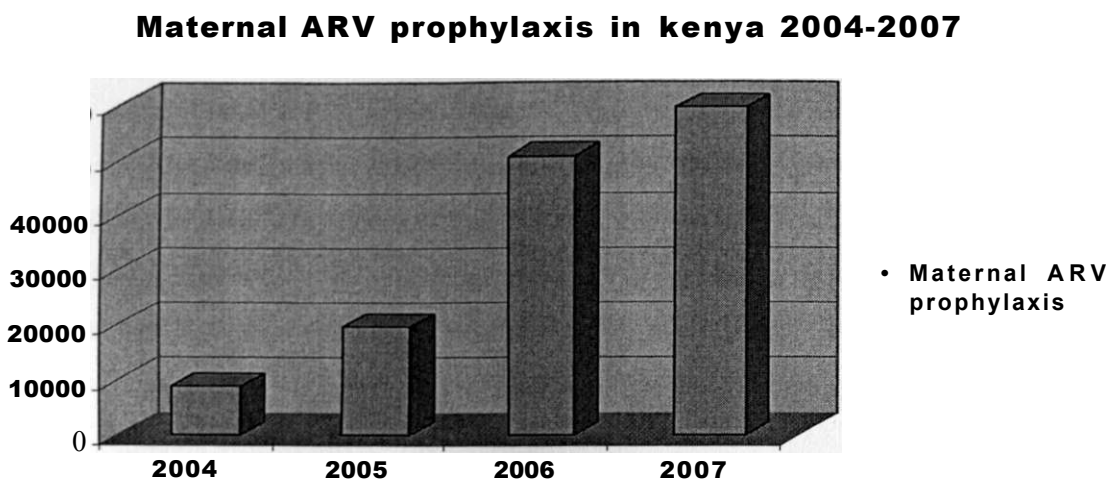
Figure 3: The number of pregnant women counselled and tested in Kenya.



Source: US AID Kenya report, 2008.

1.1.6.4.4 Uptake of ARV prophylaxis by HIV infected women and their infants ,

Figure 4: The number of HIV positive pregnant women given maternal ARV prophylaxis in Kenya.



Maternal ARV Prophylaxis coverage was 23.55% in 2004, 47.09% in 2005, 64.2% in 2006 and 64.2% in 2007 showing a gradual improvement. Infant prophylaxis has lagged behind mother prophylaxis with 23% of HIV exposed infants receiving prophylaxis in 2007 (Ayisi 2007).

The number of HIV positive pregnant women who received maternal ARV prophylaxis gradually increased from 9,103 in 2004 to 59,601 in 2007 as shown in Figure 4.

1.1.7 CHALLENGES OF DELIVERING PMCT SERVICES

The uptake of PMTCT services, in part, is dependent on the uptake of ANC services and therefore PMTCT should be integrated into MCH in all health facilities providing Maternal and Child health (MCH) services. Kenya National PMTCT training curriculum (2005) identifies the following challenges in the uptake of ANC services;

1. Inadequate staffing
2. Deficient infrastructure to support implementation of services
3. Irregular/insufficient supplies
4. Inadequate record storage facilities.

On average, thirty percent of women who visit the PMTCT sites for antenatal care (ANC) are not counseled on PMTCT. Of those women who do receive counseling, three out of ten are not tested for HIV. Of those women who test positive for HIV, just under half receive antiretroviral drugs. Although these proportions have increased over time, raising them further remains a critical task for program managers and PMTCT advocates.

The coverage of PMTCT counseling is increasing but staff shortages and service delivery organization continue to affect uptake. Shortage of staff in general and trained staff in particular, is still among the most important constraints on the program (Evaluation report: Evaluation of United Nations-supported pilot projects for the prevention of mother-to-child transmission of HIV 2003 Global).

There are a number of factors that affect the uptake of ARV prophylaxis such as socio-cultural factors, male participation in PMTCT, policy issues like ARV regimen in use. Institutional factors **such** as quality of basic ANC and safe motherhood programs, quality of PMTCT counseling services, availability of trained health care workers to offer the services, pharmacy support to the PMTCT program, staff attitude among others affect ARV prophylaxis uptake.

CHAPTER 2: LITERATURE REVIEW

2.0 HIV in women and children

In 2007 an estimated 33.2 million people were living with HIV/AIDS among them 15.4 million women and 2.1 million children and in addition there were 2.5 million newly infected people. In the same year there were 2.1 million deaths among them 20,000 children (UNAIDS, 2009). Two thirds of all people living with AIDS and 90% of the infected children live in sub-Saharan Africa, with Eastern and Southern Africa being the epi-centre of the epidemic.

Majority (90%) of HIV infected children acquire the infection through MTCT. Globally, an estimated 600,000 new pediatric infections occur each year, of which some 1500/day (> 90%) occurs in sub-Saharan Africa. Another 14 million children, 90% in sub Sahara Africa have been orphaned by HIV/AIDS. In sub-Saharan Africa, almost 61% of adults living with HIV in 2008 were women (UNAIDS, 2009). The World Bank Policy Research Working Paper No. 3956 presented data for Burkina Faso, Cameroon, Ghana, Kenya, and Tanzania showing that two-thirds of HIV infected couples are discordant couples and that between 30 and 40 percent of the infected couples are couples where only the female partner is infected (Damien *et al* 2006).

Moreover, over 20 percent of pregnant women are estimated to be HIV-positive in Kenya, Malawi, Tanzania, Uganda, Zambia and Zimbabwe — over 40% in Botswana. Nearly 1 out of 10 pregnant women in Kenya are infected with HIV (9.6 percent) with minimal differences by urban and rural residence Kenya AIDS Indicator Survey (KAIS) 2007. Rates among women who gave birth in the last 4 years is similar at 9.0 percent. The AIDS crisis in sub Sahara Africa has been recognized in various forums (East and Southern Africa Sub regional Follow-up Conference to the World Social Summit (1999). Unless urgent measures are taken, AIDS may increase U5MR by over 100 percent in at least 8 countries of the sub-region by 2010 (UNAIDS 2007).

2.1 Clinical course of HIV in children

Children with HIV infection suffer from the same common childhood illnesses as those who are not infected. The illnesses are, however, more frequent, last longer and may respond poorly to usual treatments. Without access to highly active anti-retroviral treatment, the disease progresses rapidly. African studies have documented increased mortality among children born to HIV infected women in the 2 years preceding the study with the death rate among children of HIV positive mothers almost double the rate of children of sero-negative mothers (Konde-Lule *et al* 1990). HIV infection

is associated with increased in-hospital case fatality from common childhood infections such as pneumonia (Eduardo *et al* 2005). In a large meta-analysis of data of African children enrolled in treatment trials, up to 45% of infected children developed AIDS and died within the first two years of life (Marie-Louise 2006). However, some children with HIV infection have an adult pattern of disease, with HIV-related symptoms appearing 10 or more years after initial infection. The quality of life for long surviving HIV infected children who do not have access to ARVs is not necessarily good. For example, early AIDS-defining illness increased the risk of chronic static encephalopathy during the pre-school and early school age years (Wits study - Renee *et al* 2006). In industrialized countries, where infected infants have easy access to ARV therapy, more than 80% are still alive at the age of six. It is a different picture in developing countries where children with HIV infection often die from common childhood diseases even before developing severe immuno-suppression. Many HIV-related deaths in developing countries can be prevented by early awareness, early diagnosis and the correct management of common childhood diseases (UNAIDS, 2002).

2.2 Anti-retroviral drugs in the prevention of mother to child transmission of HIV

2.2.1 ARV mono-therapy for PMTCT

Human Immunodeficiency Virus (HIV) infection can be averted through the use of anti-retroviral drugs (Agnes *et al* 1999). Anti-retrovirals work mainly through two mechanisms (i) Reducing the viral load in the mother (a lesser quantity of virus goes to the infant) and (ii) Preventing the virus from "fixating" itself in the child ("post-exposure prophylaxis"). In 1994, a landmark study conducted by the Pediatric AIDS Clinical Trial Group protocol 076, demonstrated that AZT, given to HIV-infected women during pregnancy, delivery and post-natally to both mother and infant in a population with minimal or no prior antiretroviral therapy reduced the risk of MTCT by two-thirds, from 25 percent to 8 percent. At the time this study was carried out, ARV's been extremely expensive and therefore completely out of reach for developing countries where the majority of HIV infected women live. Therefore, trials were designed to evaluate shorter duration of AZT in Thailand among a non-breastfeeding population and later in West Africa in a breastfeeding population. The Thailand study demonstrated Zidovudine initiated at 34-36 weeks of pregnancy and given through to delivery reduced mother to child HIV transmission by half among non-breastfeeding HIV infected women. In this study, MTCT transmission was 9.4% on Zidovudine and 18.9% on placebo and efficacy was 50.1 % (Shaffer *et al* 1999). Since then many other protocols have been evaluated and shown to have varying efficacy in breastfeeding populations (Dabis 1999, Wiktor 1999, Jackson 1987). In the Ditrane study carried out in Cote d'Ivoire and Burkina Faso among breastfeeding HIV infected women with Zidovudine given from 34-36 weeks to delivery, probability of HIV infection in the infant at 6 months was 18.0% in the Zidovudine

group and 27.5% in the placebo group. The regimen led to a 38% reduction in early vertical transmission of HIV-1 infection despite breastfeeding (Dabis *et al* 1999). A similar study done without postpartum dose was aimed at assessing the safety and efficacy of short course perinatal oral Zidovudine among HIV-1 positive breastfeeding women in Abidjan showed that the estimated risk of HIV-1 transmission in the placebo and Zidovudine groups were 21.7% and 12.2% at 4 weeks and 24.9% and 15.7% at 3 months respectively and that the efficacy of Zidovudine was 44% at age 4 weeks and 37% at 3 months (Wiktor *et al* 1999). A third study, HIVNET 012 evaluated the efficacy of an intrapartum only ARV prophylaxis. In a randomized clinical trial to evaluate the efficacy of two short course antiretroviral drug regimens for prevention of HIV transmission from infected mothers to their babies found single dose Nevirapine (sdNVP) given to the mother at the onset of labor and to the infant within 72 hours of life reduced the risk of perinatal HIV transmission among breastfeeding women in Uganda by 47% at 14-16 weeks and by 41% at 18 months compared to a short intrapartum/neonatal regimen of AZT (Jackson *et al* 2003). A longer period of follow up to the HIVNET 012 study showed that estimated risks of HIV-1 transmission in the Zidovudine and Nevirapine groups were 25.8% and 15.7% by age 18 months, respectively. Nevirapine was associated with a 41% reduction in relative risk transmission through to age 18 months (Jackson *et al* 2003). The simplicity and affordability of the sdNVP enabled African governments for the first time to begin to integrate PMTCT into the health care settings.

2.2.2 Dual ARV therapy for PMTCT

In general, combination regimens are more efficacious than single-drug regimens. A meta-analysis of individual records of data from several African MTCT-prevention trials indicated that the combination of AZT and 3TC from 36 weeks of pregnancy had greater efficacy in preventing MTCT than ARV monotherapy with either AZT from 36 weeks of pregnancy or Sd-NVP (Leroy *et al* 2005). Studies in high-income countries also indicate that a combination of ARV drugs is more efficacious than single-drug regimens (Laurent *et al* 2001). In a cohort study in the United States, the risk of MTCT was 10.4% among women receiving AZT monotherapy, 3.8% among those receiving dual ARV regimens and 1.2% in women receiving triple-ARV regimens (Cooper *et al* 2002).

2.2.3 CD4 driven ARV therapy for PMTCT

The current consensus being treatment with HAART for women meeting eligibility criteria and prophylaxis with ZDV +sdNVP plus combivir tail for women not needing treatment and sdNVP and 1 week ZDV for babies and extended infant ARV prophylaxis for those that are breastfeeding (IAS Cape town, 2009).

2.3 Preventing breast milk transmission of HIV

In sub-Saharan Africa, where breastfeeding is critical for infant survival, postnatal transmission of human immunodeficiency virus type 1 (HIV-1) occurs in up to 16% of untreated infants when breast-feeding continues into the second year of life (Wilfert *et al* 2007). The main mode of postnatal mother to child HIV transmission is breastfeeding (Kenya National Curriculum and Implementation Guide for health care Providers, 2007). Breastfed babies continue to acquire new infections as long as they are breastfed. Breastfeeding contributes 10-15% of HIV infections due to MTCT and therefore significantly reduces the efficacy of ARV prophylaxis in PMTCT. Breastfeeding erodes the efficacy of ARV prophylaxis provided for prevention of MTCT of HIV. Breastfeeding through 6 months leads to approximately 10% extra transmission (from 20% to 30%) while breastfeeding through 18-24 months leads to approximately 17.5% extra transmission (from 20% to 37.5%) compared to no breastfeeding (Kevin *et al* 2000). The estimated annual risk of late postnatal transmission of HIV after 2.5 months of age was 3.2 cases per 100 breastfed children born to HIV infected women (CI: 3.1-3.8) in data collected before the use of ARV (Leroy *et al* 1999).

Although effective interventions have been identified to reduce in utero and intrapartum transmission of HIV-1 in resource-limited countries, breast-feeding attenuates the efficacy of such methods (Leroy *et al* 2002). Thus, a major concern in developing countries is HIV-1 transmission through breast milk (John-Stewart *et al* 2004). To optimize the survival of infants who are born to mothers with HIV-1 infection, interventions that allow safe breast-feeding during the first 6 months of life or longer are needed.

In Kenya, the frequency of breast milk transmission of HIV-1 was 16.2% in the randomized clinical trial, and the majority of infections occurred early during breastfeeding. The use of breast milk substitutes prevented 44% of infant infections and was associated with significantly improved HIV-1-free survival (Nduati *et al* 2000). Breastfeeding is normally the best way to make decisions on how to feed an infant. Although only part of this increase in child mortality is the result of HIV infection through breastfeeding, countries need urgently to develop and implement sound public health policies on infant and young child feeding, including the effects of HIV. The risk of transmission through breastfeeding among women recently infected with HIV is nearly twice as high as for women infected before or during pregnancy, because of high viral load shortly after initial infection (WHO/UNICEF/UNAIDS 2003).

There are four possible strategies for preventing breast milk transmission of HIV:

1. Decrease the duration of exposure to breast milk - complete replacement feeding or shortened breastfeeding.
2. Make the mother less infectious by providing ARV's for prophylaxis or treatment.
3. Modify factors affecting the transfer of virus from mother to infant - exclusive breastfeeding.
4. Increase the infants' defences - giving pre- and post exposure prophylaxis.

Complete avoidance of breastfeeding is efficacious in preventing MTCT of HIV, but this intervention has significant associated morbidity (e.g. diarrhea morbidity if formula is prepared without clean water). If breastfeeding is initiated, two interventions: 1) exclusive breastfeeding during the first few months of life; and 2) extended antiretroviral prophylaxis to the infant (nevirapine alone, or nevirapine with zidovudine) are efficacious in preventing transmission (Horvath *et al* 2009). Extended prophylaxis with nevirapine or with nevirapine and zidovudine for the first 14 weeks of life significantly reduced postnatal HIV-1 infection in 9-month-old infants (Newton *et al* 2008).

2.4 World Health Organization guidelines on HIV and Infant Feeding

Given the need to minimize the risk of HIV transmission to infants while at the same time not increasing their risk of other causes of morbidity and mortality, WHO/UNICEF/UNAIDS HIV and infant feeding guidelines for decision-makers (2003) recommendations state that "when replacement feeding is acceptable, feasible, affordable, sustainable and safe, avoidance of all breastfeeding by HIV infected mothers is recommended. Otherwise, exclusive breastfeeding is recommended during the first months of life" and should then be discontinued as soon as feasible. The recommendations further state that "when HIV-infected mothers choose not to breastfeed from birth or stop breastfeeding later, they should be provided with specific guidance and support for at least the first two years of the child's life to ensure adequate replacement feeding".

2.5 International and Local experience in delivery of PMCT services

Prevention of mother-to-child transmission (PMTCT) of human immunodeficiency virus (HIV) in the United States and Europe has been a tremendous success, such that transmission rates of less than 2% have been achieved. Some key successes have also been demonstrated in resource-poor countries. However, the translation of successful interventions into public health policy has been slow because of a variety of factors such as inadequate funding and cultural, social and institutional barriers (Fowler *et al* 2007).

The attainment of the UNGASS 2010 target of reducing infections by 50% by 2010 necessitates that 80% of all pregnant women accessing ANC receive PMTCT services (Luo *et al* 2007). Globally only seven low and middle income countries, with available data, provided ARV prophylaxis to at least 40% of the estimated total number of women living with HIV giving birth in 2005. According to the report Kenya is not one of the Low Income Countries with at least 40% of estimated HIV positive pregnant women receiving ARVs for PMTCT and she is on the way to missing the UNGASS targets if progress is not stepped up. In 2005, 8% (173,180/2,086,793) of all infants estimated to be exposed to HIV received ARV prophylaxis as part of the PMTCT package, up from 5% in 2004. The report further showed that the percent of HIV positive pregnant women receiving ARV prophylaxis in 2004-2005 in East and Southern Africa increased from 9% in 2004 to 14% in 2005 which is still below UNGASS target of over 80% ARV prophylaxis uptake. Roughly half a million women tested positive for HIV at PMTCT sites in 2005 yet fewer than 50% of these women actually received ARV prophylaxis. About a quarter of the infants born to women who received ARV are slipping through the cracks of health systems and not receiving the necessary ARV prophylaxis needed at birth.

Despite the impressive efficacy of the short-course PMTCT regimens in research clinical trial settings, the translation into public health policy in resource-limited international settings has been disappointingly slow. This is due to a variety of factors including weak and crumbling health care infrastructure in some settings, lack of integration of PMTCT programs into maternal child health services, limited donor funding support, PMTCT drug and HIV test kit stock outs and the fact that many women in resource limited settings deliver at home or outside medical facilities in which PMTCT services are available (Mary *et al* 2007).

Although simple, inexpensive drug regimens for PMTCT are available, there are still barriers to widely implementing and national scaling up of these regimens because of inadequate funding, socio-cultural, and institutional barriers. Currently it is estimated that less than 10% of HIV-infected women in sub-Saharan Africa receive any antiretroviral during pregnancy or delivery (Peter *et al* 2006).

Many studies have been done on the best practices in delivering and scaling up PMTCT services. Some of the best practices in PMTCT include staff recruitment, integrating PMTCT within ANC and other health care service delivery, mothers coming for pre-test counseling, training of HCWs in PMTCT and motivation of mothers (e.g. provision of ARVs, food supplements). Other best practices noted include reduced waiting time, treatment of opportunistic infections, involvement of male partners, confidentiality, active follow up/ monitoring, availability of coordination

committees, regular support supervision from districts, private sectors when involved can provide better services, PMTCT work plan integrated into district work plan and most HIV positive mothers delivering at health facility (Barbara in Wrap up of Implementation Experience and report from support supervision, 2006).

In two rural districts of Zimbabwe it was noted that 79% accepted HIV testing if opt-out testing was introduced and this significantly increased the uptake of PMTCT services (Perez *et al* 2006). Furthermore, partner involvement is critical in increasing PMTCT service uptake. The need for partner consent is the main reason for opting out of routine HIV testing for prevention of mother-to-child transmission in a rural Ugandan hospital (Homsy *et al* 2007). Similarly, a study done with women attending a Nairobi antenatal clinic found out that partner participation in VCT and couple counseling increased uptake of interventions to prevent HIV-1 transmission. These data support antenatal couple counseling as a strategy to reduce peri-natal HIV-1 infection risk in developing countries (Farquhar *et al* 2004).

HIV screening should be included in the routine panel of prenatal screening tests for all pregnant women unless the patient declines (opt-out screening). This reduces peri-natal transmission of HIV by fostering earlier detection of HIV infection. Perinatal transmission rates can be reduced to <2% with universal screening of pregnant women in combination with prophylactic administration of antiretroviral drugs (Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings, 2006).

Rapid HIV-1 testing significantly increased the proportion of women receiving HIV-1 results amongst pregnant women attending public health clinics in Nairobi, which is important for sexual and peri-natal HIV-1 prevention (Malonza *et al* 2003).

A study done in a rural Uganda hospital demonstrated that intra-partum HIV Counseling and Testing (HCT) was an acceptable and feasible way to increase individual and couple participation in PMTCT interventions (Homsy *et al* 2006).

Mother to mother support provides enabling environment to the woman to share experiences and concerns so as to increase utilization of the PMTCT services (Amina 2008).

2.6 Challenges to delivery of PMCT services

Increasing awareness, understanding and commitment to the four elements of PMTCT is critical. One of the lessons learned by program planners and implementers is that a great deal of the success of programs depends on a supportive and enabling policy environment. The environment encompasses laws - including constitutional and human rights laws, regulations and policies at national and operational levels, the decision making processes surrounding policy formulation, planning and budgeting, the actual allocation of material and financial resources at all levels, the use of data in policy analysis, the institutional arrangements for implementing programs and the support of civil society including religious leaders and PLWA. Poor or unfavorable operational policies are largely responsible for the low coverage of essential services in low and middle income countries (Assessment report -AWARE HIV/AIDS PROJECT 2003-2008).

Full integration with other services may ease the counseling burden, workload is still likely to be increased but without sufficient staff, and staffing shortages may therefore be a limiting factor (WHO/UNICEF/UNAIDS 2003). Uphold Working Paper: Prevention of Mother to Child Transmission of HIV notes that shortages of human resources for health coupled with the constant reshuffling of staff within the health unit, transfer out to other health units or migration leaves providers that have no proper orientation/knowledge on the subject. This therefore creates a gap in the ability of the unit to provide the service (Samson *et al* 2007).

African Governments continue to face inadequate human resources coupled with high staff turnover and financial resources and poor or inadequate institutional capacities affect the implementation of national programs (Regional Ministerial Review Conference on Implementation of the Dakar/Ngor Declaration and the Programme of Action of the International Conference on Population and Development, 2004).

Some of the challenges facing effective PMTCT scale up in Uganda include inadequate physical infrastructure, lack of human capacity, inadequate and inconsistent delivery of drugs and supplies, limited community mobilization & follow-up and high stigma levels (Kindyomunda *et al* 2003). A study done on implementation of PMTCT programme in Uganda showed that the uptake of the PMTCT program has been fairly good. However, if the intervention has to reach more beneficiaries, there is need to look critically at human resource capacity of the implementing sites and to address the poor enrolment ratio of HIV positive mothers especially in up country areas. Sites which had some "extra human resources" were able to counsel 94% of all new ANC attendance and to provide ARV to 38% of their estimated HIV positive population. Sites without any "extra human resources"

were able to counsel only 26% of all new ANC attendance and to provide ARV to only 9% of their estimated HIV positive population (Onyango *et al* 2002).

Wrap up of Implementation Experience and report from support supervision noted that in the Uganda Ministry of Health challenges facing PMTCT scale up include health workers not positive to the programme, increased workload, limited resources - human and financial, low motivation of PMTCT staff, inconsistent messages by health workers given to mothers about infant feeding options and withdrawal of the supply of infant formulae at the PMTCT sites (Barbara *et al* 2006).

Adequate staffing of delivery wards is crucial and critical for enhanced PMTCT. Enhanced PMTCT in labor and delivery settings is feasible and labor ward based strategies target women at multiple points in the PMTCT cascade (Namwinga *et al* 2008).

In a study done in Francis town, Botswana showed that nearly all PMTCT providers (90%) had formal PMTCT training (Creek *at al* 2003). However, training is not the only limiting factor for effective infant feeding counseling. Health worker performance depends also on the health system. Often policies are unclear or non-existent, health systems are weak, staff turnover and attrition is high, supervision is limited or poor, time for performing the expected tasks is insufficient, and job satisfaction is low (WHO, 2004). Furthermore, training of health care workers on PMTCT and provision of HIV test kits and NVP is not adequate preparation for up-scaling PMTCT (Nduati *et al* 2004).

About 70% of the Kenyan population knows about mother to- child transmission of HIV. About 2/3 in both surveys knew that HIV can be transmitted through breastfeeding. However, knowledge of specific actions that mothers could take to prevent mother to child transmission was low, and less than 1/3 of respondents in all age groups suggested that medications could reduce transmission of HIV from mother to infant. Therefore, dealing with incomplete knowledge of ways to reduce mother to child transmission remains an important challenge for national PMTCT programme (Kenya Demographic Health Survey and Behavioral Surveillance Survey, 2003).

Seventeen studies identified from peer-reviewed journals and international conference abstracts (15 from sub-Saharan Africa and 2 from south-east Asia) demonstrated that the low rates of HIV sero-status disclosure reported among women in antenatal settings have several implications for prevention of mother-to-child transmission of HIV (PMTCT) programmes as the optimal uptake and adherence to such programmes is difficult for women whose partners are either unaware or not

supportive of their participation (Medley *et al* 2004). Similarly, a study in Rwanda found out that not disclosing one's HIV status to someone aside from a partner was also associated with non-adherence in mother-infant pairs (Delvaux *et al* 2009).

In Rwanda providing voluntary HIV counseling and testing within antenatal clinic services is the most challenging component of the MTCT intervention where 70% accepted to be tested for HIV (Karita *et al* 2000).

A study in Vietnam revealed that among the 52 women, only 23 (44%) mother-child pairs received ARV prophylaxis, while 20 pairs did not receive any prophylaxis at all. One reason for this disappointing record was that in many health care facilities, the ARV was not consistently available (Thu *et al* 2008). In Vietnam, program deficits clustered around the general areas of provider misunderstanding of occupational HIV risk and MTCT, impractical PMTCT policies, and practices hampering effective use of prevention and treatment protocols (Chinh *et al* 2008).

A study in Kenya showed that none of the health facilities were able to provide the essential antenatal care package largely because of short supply of essential consumables and the clients' inability to pay for the services. The MCH and maternity universally did not have any private space to be used for counseling. The staff at all 4 district hospitals initiated PMTCT after receiving the necessary training, however uptake of testing was only 20% in the sites where there was poor staffing compared to 50% in the better-staffed units because of frequent stock-outs of supplies and staff (Nduati *et al* 2004).

Uphold Working Paper: Prevention of Mother to Child Transmission of HIV notes that stock-outs of HIV test kits and/ or nevirapine (tablets or syrup) within the health units are causing missed opportunities. This is made worse by little involvement of the male partners and other family members, who are the key decision makers when it comes to delivery plan (Samson *et al* 2007).

Disintegration of service provision causes many missed opportunities, for example, HIV counseling and testing can only occur in the out patient yet there are mothers who come to the health facility just for delivery and the nevirapine tablets and syrup are only found in labor wards (Samson *et al* 2007). Wrap up of Implementation Experience and report from support supervision noted that in the Uganda Ministry of Health some of the challenges facing PMTCT scale up include inadequate supervision from district and national levels at the PMTCT sites, lack of physical infrastructure and stigma (Barbara *et al* 2006).

CHAPTER 3: STATEMENT OF THE PROBLEM

3.0 Problem statement

Pediatric HIV/AIDS is still posing challenge in the fight against HIV/AIDS globally and particularly in developing countries. Mother-to-child HIV transmission (MTCT) accounts for nearly 90% of the more than 600,000 estimated new HIV infections that occur in children worldwide each year (UNAIDS 2009). Without intervention, there is a 25-40% risk of a HIV-infected mother transmitting HIV to her child during pregnancy and delivery, and an additional 10-20% risk of transmission through breastfeeding. In sub-Saharan Africa, where over 5% of pregnant women are HIV infected, the HIV/AIDS pandemic has had devastating effects on infant survival and on families. This contributes significantly to the increase in pediatric HIV/AIDS and the associated morbidity and mortality and therefore reversing the gains made in child survival over the past decade.

Comprehensive prevention of mother-to-child HIV transmission (PMTCT) programmes have nearly eliminated MTCT in developed countries. However, progress in implementing similar prevention programmes in resource-poor settings has been slow and disappointing in many countries Kenya inclusive. In Kakamega district, the situation is worse with the number of HIV positive pregnant women receiving the full ARV prophylaxis as per the national guidelines being below the national average of 64.2% and is below the national target for ARV prophylaxis uptake which is currently over 80%.

The quality and success of PMTCT programme is dependent on many factors such as the: policy issues like ARV regimen in use, system of administration; socio-cultural factors like gender roles and male participation in PMTCT programmes, stigma surrounding HIV testing and being HIV positive, poverty levels; Institutional factors like the quality of basic ANC/safe motherhood programmes and availability of ARVs. In addition, human resource issues like availability of trained staff, staff attitude, number of staff, quality of health facilities supervision, policy implementation contribute significantly to quality of PMTCT service delivery. Inadequate monitoring and documentation of interventions provided to HIV positive pregnant women to prevent MTCT also contributes to lower PMTCT programmatic indicators. Lack of one or more of the above factors can potentially affect the uptake of ARV prophylaxis in a PMTCT setting.

The quality of care as determined by the rights of clients to safe services, privacy and confidentiality, informed consent, information, access to services, dignity, comfort and expression

of opinion and continuity of care are other institutional factors that have a significant impact on PMTCT service delivery.

Quality of PMTCT counseling services such as pretest sessions, HIV test and post-test sessions also affects ARV prophylaxis uptake amongst HIV positive pregnant women. Unfriendly health facilities, health worker attitudes, lack of family approach to MCH service delivery had also been cited as some of the challenges facing PMTCT implementation and directly affect the uptake of ARV prophylaxis amongst HIV positive pregnant women.

Not enough is known regarding the effect of the institutional factors in Kakamega district and the extent to which they are affecting service delivery especially the uptake of ARV prophylaxis. This study sets out to determine the institutional factors in Kakamega district that affects the ARV prophylaxis uptake and come up with relevant recommendations. The research question to be investigated is: To what extent does the institutional factors affect ARV uptake in greater Kakamega district?

3.1 Justification of the study

Families and communities throughout the world hope for healthy babies. Mother to child transmission of HIV has become a major area of concern in Kenya, where at least 50,000-60,000 infants become HIV infected each year due to mother to child transmission of HIV (NACC 2005). This is despite Kenyan's Ministry of Health, through NASCOP, taking several actions to expand and strengthen the quality of PMTCT interventions in the country. ARV prophylaxis remains one of the core interventions in averting new pediatric HIV infections.

One of the most tragic consequences of the HIV/AIDS epidemic is the huge number of children orphaned as a result of parents dying from AIDS. Some of these children are HIV-positive themselves - having been infected by their mothers either at birth or through breast milk. The number of orphans is emerging as a massive challenge - and the time to act is now. Without significant changes in sexual behavior or interventions, about 15% of all children under the age of 15 are expected to be orphaned by 2015. By 2015 the total number of orphans under 15 is likely to be around 2.26 million, 200 000 more than in the absence of mother-to-child transmission prevention programme (NACC 2005).

In Kenya, it is estimated that between 130,000-180,000 children are living with HIV. The vast majority acquired infection through mother-to-child transmission. Orphans and vulnerable children

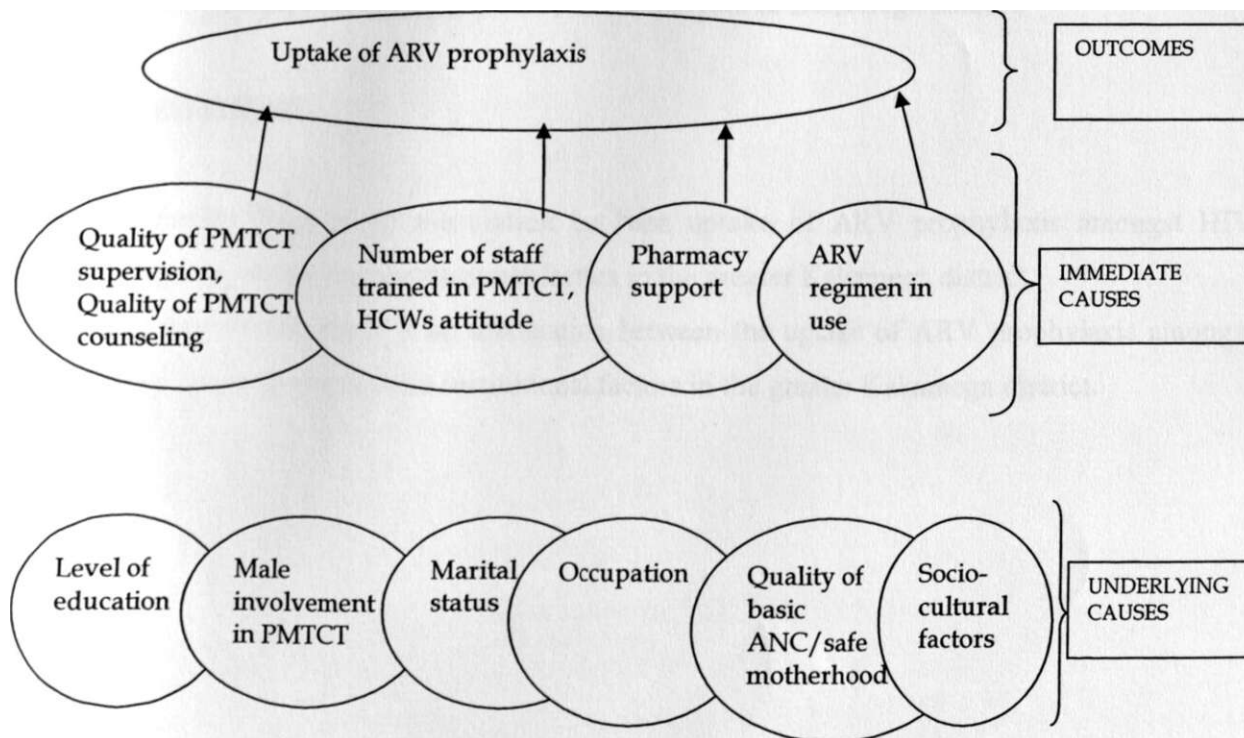
(OVC) are a major national and international concern. Half of the 31.5 million people in Kenya are children under 18 years of age. It is estimated that 1.5 million Kenyans have died of AIDS, leaving approximately 1.6 million orphans. About 55%-60% of orphaned children have lost their parents due to HIV/AIDS (NACC 2005).

According to Kenya Vision 2030, some of the key focus areas in the health sector include quality and capacity of the health care delivery system and addressing these areas will help reduce Kenya's high infant and under-five mortality rates attributed to the HIV/AIDS pandemic.

The national PMTCT programme target is to have over 80% ARV prophylaxis uptake and to use more efficacious regimen that have about 80% efficacy compared to single dose Nevirapine with efficacy of 50%. ARV prophylaxis uptake remains one of the key interventions in prevention of mother to child transmission of HIV. Institutional factors are known to affect the ARV prophylaxis but it is not clear to what extent Kakamega district is affected.

3.2 Conceptual framework

Figure 5: Conceptual framework on ARV prophylaxis uptake



Source: Green's Model (1995).

3.3 OBJECTIVES

General Objective

To determine the institutional factors affecting uptake of ARV prophylaxis amongst HIV positive pregnant women in Kakamega district.

Specific objectives

1. To determine the socio-demographic characteristics such as age, marital status, religion, educational level, occupation of HIV positive pregnant women in Kakamega district;
2. To determine the socio-demographic characteristics such as age, religion, marital status, location of PMTCT counselors providing PMTCT services in Kakamega district;
3. To assess the quality of PMTCT counseling and quality of PMTCT services in Kakamega district;
4. To determine the awareness level of HIV positive pregnant women on the use of ARV prophylaxis in Kakamega district;
5. To identify the maternal and infant ARVs prophylaxis uptake in Kakamega district;
6. To determine the PMTCT providers training and experience, knowledge and attitude in Kakamega district;
7. To describe the pharmacy support for PMTCT in Kakamega district;
8. To describe supervision support to PMTCT services in Kakamega district.

3.4 HYPOTHESIS

Null hypothesis: There is no association between uptake of ARV prophylaxis amongst HIV positive pregnant women and institutional factors in the greater Kakamega district.

Alternative hypothesis: There is an association between the uptake of ARV prophylaxis amongst HIV positive pregnant women and institutional factors in the greater Kakamega district.

CHAPTER 4: METHODOLOGY

4.0 Study design

A cross-sectional study design was conducted using both qualitative and quantitative methods. Qualitative methods such as participatory observations, in-depth interviews with key informants and stakeholders were used. Quantitative methods used included hospital records review and exit interviews.

4.1 Study area

Background information of study area

Kakamega district is one of the most densely populated rural districts in Kenya. Kakamega district has recently been subdivided into Kakamega central, Kakamega North, Kakamega East and Kakamega South districts in July 2007. In this study Kakamega district comprised all the four districts.

Kakamega is one of the eight districts of Western Province, with a total projected population of 793,164 people by 2007. It is administratively divided into seven (7) divisions, sixteen (16) locations and ninety-eight (98) sub-locations. The population growth rate is 4.1% per annum.

Climatically there are two rainy seasons - long rains (March to August) and short rains (September to November). Kakamega district is predominantly agricultural; most of the farmers practice small scale peasant farming (Ministry of health, Kakamega district, annual health plan, FY - 2007/2008).

4.1.2 PMCT services in Kakamega District

Prevention of Mother to Child Transmission of HIV (PMTCT) services in Kakamega district started in 2000 with the Provincial hospital being one of the original five PMCT pilot sites. It has shown a steady growth from five PMCT sites in 2003 to twenty one PMCT sites in 2007. This represents 39% (21/54) of the health facilities offering ANC services in Kakamega district. This is way below the national target of scaling up PMCT services to at least 80% of the health facilities by 2007. In Kakamega district, the maternal ARV prophylaxis uptake is 56.1%. This is below the national average of 64.2% uptake and this reduces the effectiveness of PMTCT programme in reducing HIV transmission from mother to child in the district (Ayisi 2007). With the ARV prophylaxis uptake of 56.1% and the use of sd NVP, 28% of new pediatric infections are averted annually in Kakamega district. If the ARV prophylaxis uptake reaches over 80% and with the use of sd NVP, over 40%

(2572) new pediatric infections would be averted annually in Kakamega district. This number of pediatric infections averted annually will significantly increase with the use of more efficacious regimens.

In 2006 Western Province recorded a maternal ARV prophylaxis of 56.1%. Infant ARV prophylaxis coverage in 2005 was 56% while in 2006 infant prophylaxis stood at 39% (Ayisi, 2007). In order to achieve the goals of HIV uninfected children there is a need for universal coverage with PMCT. The attainment of this goal remains a challenge.

4.1.3 Demographic profile

Table 3: Demographic profile for Kakamega district

	Description	District proportions	Eligible population
1	Total catchment population		793,164
2	Children under 1 year (12 months)	4.33%	34,344
3	Children under 5 years (60 months)	17.3%	137,217
4	Under 15 year population	47%	372,787
5	Women of child bearing age (15 - 49 Years)	23.5%	186,394
6	Estimated Number of Pregnant Women	4.33%	34,344
7	Estimated Number of Deliveries	4.33%	34,344
8	Live Births	4.33%	34,344
9	Estimated Number of emergency obstetric complications	578	520
10	Estimated Number of Post-Abortion Cases	263	236
11	Total number of Adolescent (15-24)	21.2%	168,151
12	Adults (24-59)	28.4%	225,259
13	Elderly (60+)	4.9%	38,865

Source: Ministry of Health, the greater Kakamega district, annual health plan, FY - 2007/2008

Table 4: Catchment Populations per Facility

Name of Health Facility (a)	Total Catchment Population (b)	Total Outpatient Attendance (c)	ANC attendance (d)	Utilization Rate (d) = c/b x 100
PGH Kakamega	66,339	54,584	8,404	82
Malava SDH	97,421	49,811	7,321	51
Navakholo SDH	34,182	30,673	2,956	90
Mukumu Mission Hospital	48,676	42,000	3,314	86
Bukura HC	39,975	24,338	1,985	61
Ingotse HC-FBO-Church of God	11,104	3,393	405	31
Eshikhuyu HC	9,439	5,696	346	60
Ematioli HC-FBO	1,666	990	102	59
Emukaya DH	3,331	1,794	181	54
Bushiri HC	38,865	23,635	1,864	61
Elukhambi Dispensaary	1,110	900	92	81
Shikokho Dispensary	1,904	798	81	42
St. Pius Musoli Disp-FBO	3,450	2,691	156	78
Shiseso HC	17,846	7,400	401	41
Ighu HC	27,245	21,025	1,678	77
Kilingili HC	27,721	21,419	1,768	77
Shibwe HC	19,750	15,263	1,237	77
Bushiangala HC-Church of God	1,428	1,079	98	75
Savane HC	12,849	9,894	506	77
Eregi HC-Catholic	6,782	5,247	378	77
Kambiri HC	14,753	16,139	1,456	109
Ileho HC	8,566	8,548	487	100
Shikusa Prison HC	24,175	26,178	1,981	108
Chimoi Disp-Catholic	14,495	7,372	459	51
Shivanga Disp	5,909	1,494	132	25
Shihome Disp	18,441	9,474	502	51
Namagara Disp	12,888	4,473	237	35
Kuvasali HC	15,450	7,833	497	51
Chombeli Disp	33,707	9,563	382	28
Shikusi Disp	22,248	9,913	351	45
Kakamega Forest Disp	12,405	5,244	301	42
Shamakhubu HC	24,405	10,884	567	45
Sivilie Disp	19,726	19,726	1,634	100
Kharanda Disp	13,401	15,870	1,002	118
Budonga Disp	16,154	16,054	1,112	99
Buchangu Disp	4,924	4,824	334	98
Lutaso Disp	1,085	2,006	156	185
District total	733,815	498,225	44,860	68

Source: Ministry of health, Kakamega district, annual health plan, FY - 2007/2008

4.2 Study population

The study populations comprise government and non-governmental health facilities, health care workers, and HIV positive pregnant women in Kakamega district.

4.2.1 Exclusion & inclusion criteria

4.2.1.1 Inclusion criteria

1. HIV positive pregnant women between the ages of 18-49 years residing in Kakamega district in the last 5 years who accessed PMTCT services in their current pregnancy.
2. Health facilities providing ANC, PMTCT as per the Ministry of Health/NASCOP guidelines.
3. Key informants (Health care workers) who have worked in Kakamega district for at least one year.
4. Potential participants who gave informed consent to participate in the study.

4.2.1.2 Exclusion Criteria

1. HIV negative pregnant women.
2. Pregnant women not in the age group between 18-49years.
3. Pregnant women/mothers not residing in Kakamega district or who have resided for less than 5 years.
4. Health facilities not providing ANC and PMTCT services as per the Ministry of Health/NASCOP guidelines.
5. Pregnant women who had not accessed PMTCT services, postnatal services or immunization services for their children.
6. Key informants (health care workers) who had worked for less than one year in Kakamega district.
7. Potential participants who did not give informed consent to participate in the study.

4.3 Study variables

The following variables were investigated in this study:

4.3.1 Dependent variables

Maternal and infant ARV prophylaxis uptake

4.3.2 Independent variables

4.3.2.1 Demographic factors

Age, sex, religion, education level, marital status, and occupation

4.3.2.2 Health care workers

Number of staff trained in PMTCT, number of staff providing PMTCT services, HCW's attitude, HCW's knowledge on HIV and PMTCT and HCW's satisfaction

4.3.2.3 Quality of care

1. Clients rights to safe services
2. Clients rights to privacy and confidentiality
3. Clients rights to informed consent
4. Clients rights to information
5. Clients rights to access to services
6. Clients rights to dignity, comfort and expression of opinion
7. Clients rights to continuity of care
8. Clients satisfaction

4.3.2.4 Quality of PMTCT counseling services

1. Pre-test session
2. HIV test and test decision
3. Post-test session

4.3.2.5 Pharmacy support

1. Availability of ARVs
2. Availability of NVP pouch
3. Availability of syringes
4. Mentorship on ART commodity management & pharmacy supervision

4.3.2.6 Quality of supervision

1. Number of supervisory visits
2. Use of supervision checklist
3. Supervision follow ups

4.4 Sample size and Sampling procedure

The sample size was determined using the following formula for prevalence study (Olive 2004).

$$n > \frac{z^2(pq)}{d^2}$$

Where z = the standard normal deviate corresponding to 95% confidence level (=1.96)

d= margin of error, 0.1

p = the proportion of women accessing ART prophylaxis in the district =0.5 (There was no similar study in the literature, so p=0.5 was used as recommended by WHO 2000)

q = the proportion of women not accessing ARTs in Kakamega district, 1-P, 1-0.5=0.5

$$n > \frac{1.96^2 (0.5 \times 0.5)}{0.1^2}$$

= 96 HIV positive pregnant women/mothers.

To improve precision a total of 119 HIV positive pregnant women were actually sampled.

In order to sample HIV positive pregnant women, health facilities were first sampled from the study area. Then, eligible HIV positive pregnant women were then identified from the sampled health facilities. Multi-stage sampling technique was used to sample the health facilities as follows:

4.4.1 Sampling of health facilities

There are a total of 38 health facilities in the greater Kakamega district (governmental and non-governmental). Thirty (30) of these health facilities were sampled as follows:

Step 1: The health facilities were categorized according to their status namely

A. Governmental health facilities (i.e. Provincial Hospital, District Hospital, Sub-district Hospital, Health centers, Dispensary).

B. Non-governmental health Facilities (i.e. Mission Hospital, Mission Health centers, Mission Dispensary).

Step 2: Kakamega Provincial General Hospital, Malava District Hospital, Shibwe Sub-District Hospital, Navakholo Sub-District Hospital and Mukumu Mission Hospital because of their level of service provision and being referral hospitals with big catchment areas amounting to 246,618 people were all included in the study.

Step 3: Stratified sampling method was used to select the remaining twenty six (26) health facilities in the district. The health facilities were stratified as governmental health facilities and non-governmental health facilities. Further stratification was done as health centers and dispensaries.

Step 4: Using probability proportional to size (PPS) based on the ANC attendance; twenty two (22) government health facilities (11 health centers and 11 dispensaries) and four (4) non-governmental health facilities (2 Mission health centers and 2 Mission dispensaries) were sampled out.

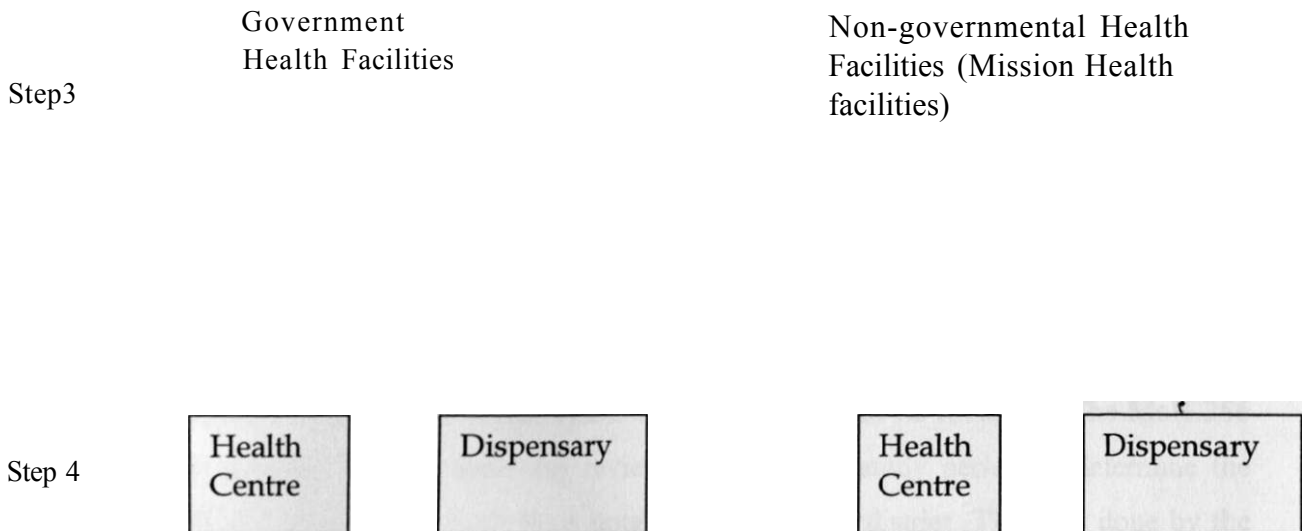
The sampling within each stratum was done using simple random sampling method and the sampling frame was derived from table 4.

The HIV positive pregnant women were then consecutively enrolled into the study from the sampled health facilities as outlined above.

4.4.2: Sampling for the HIV positive pregnant women

The sampling of the remaining twenty six (26) health facilities was done as shown in figure 6. The HIV positive pregnant women were used to determine the awareness level of HIV positive pregnant women on the use of ARV prophylaxis in Kakamega district as well as do the exit interviews.

Figure 6: Diagrammatic representation of the multi-stage sampling of health facilities.



From the sampled health facilities, all HIV positive pregnant women who met eligibility criteria were enrolled consecutively until the required numbers of HIV positive pregnant women were attained.

4.5 Data collection techniques and instruments

Thirty (30) enumerators and two (2) research assistants were identified and recruited. These were people who were familiar with the local community and had attained tertiary level of education, mostly health care workers. They were trained by the principal investigator for a period of one day. The training principally consisted of discussion of all survey tools as well as the aims and objectives of the study. The recruiters were trained on how to conduct questionnaire interviews and do the inventories check. Pilot study then was conducted to pre-test and validate the survey tools and also assess the methodology to be used in the main study.

The data collection methods and instruments were conducted using the following evaluation methodologies:

1. **Participatory observations-** Observations were used to assess PMTCT service quality, access and utilization of PMTCT services, pharmaceutical and laboratory support to the PMTCT programmes in Kakamega district.
2. **Key informant interviews with key informants** - Key informant interviews were carried out in order to validate the quantitative data and also to assess the level of pharmacy and supervisory support accorded to health facilities in the district. The key informants were

identified on the basis of their position and role in PMTCT service provision in the district. These included health facilities management staff namely: laboratory -in-charges, pharmacy in-charges, facility nursing officer-in-charges, medical superintendents/Medical officers-in-charge, DASCOs, DMLTs and PASCO. This entailed using an interviewee schedule that looked at the level of staffing, supervision support, administrative support and pharmacy support to the PMTCT programme. This was administered by the principal investigator in English.

3. ***Hospital records review-*** Review of KEMSA/DASCO/facilities pharmaceutical and laboratory as well as PMTCT records were reviewed. PMTCT strategic documents, and other reports related to FP/RH/HIV/AIDS in Kenya were also be reviewed. The MoH 256 monthly summary reports were also reviewed during the study period to determine the maternal and infant ARV prophylaxis uptake in Kakamega district. This was done by the principal investigator.
4. ***Exit interviews-*** Exit interviews with the HIV positive pregnant women were done using exit interviews questionnaires. HIV positive pregnant women who met the eligibility criteria were consecutively interviewed from the sampled health facilities on various aspects of the PMTCT counseling. The questions were structured in such a way that they covered pre-test sessions, testing sessions and post-test sessions as per the NASCOP recommendations. The exit questionnaire was translated from English to Kiswahili and back translated to access accuracy. The interviews were administered by trained enumerators based at the health facilities. The questionnaires were administered in English or Kiswahili versions depending on the preference of the participants.
5. ***Interviewee administered questionnaire for the PMTCT counselors-*** PMTCT counselors from the sampled health facilities were given two sets of questionnaires. One that was looking at their knowledge and attitude towards PMTCT and the other one was looking at the quality of PMTCT services within their facilities. The questionnaires were administered in English.
6. ***Inventory checking of the PMTCT supplies-*** An inventory checklist was used to determine the PMTCT supplies and materials available in the 30 sampled health facilities. This was done by the trained research assistants.

Quality of PMTCT counseling

According to the Kenya National HIV testing and counseling guideline March 2008, HIV testing and counseling encompasses three components:

Pre-test session

This can be individual, couple or group counseling. It may be given by a nurse-midwife or a trained lay person with the use of media such as video, flip charts, drama or leaflets to supplement. It entails providing basic information to the client(s) on HIV and includes the magnitude of HIV in Kenya and among pregnant women locally, how HIV is transmitted or not transmitted, differences between HIV and AIDS, risks of MTCT of HIV during pregnancy, childbirth and breastfeeding among others.

HIVtest

This follows pre-test session and the client can still have individual counseling sessions with the provider. Risk assessment and prevention counseling are also provided accordingly.

Post-test session

With the simple, rapid tests available in Kenya, results can be read in 15 minutes. It is preferred that the pregnant woman sees and interprets the test strips herself, with the assistance of the nurse, counselor or laboratory technician. This must always be with an individual client (or couple who are tested together) and results must be kept confidential. Components for all clients include showing test strips or explaining results simply, check for understanding, discuss the meaning of the results, both if HIV positive or HIV negative, discuss condom use and demonstration as part of risk reduction strategies, deal with immediate emotional responses and discuss immediate plans, intentions and actions. The nature of the post-test session will depend on the HIV test results.

In this study, these quantitative indicators were determined as part of assessing quality of care. Additional assessment of quality of services included observation and interviews with consumers and health care workers to evaluate the extent to which the following were considered:

Clients rights to:

1. Access to services;
2. Dignity, comfort and expression of opinion;
3. Information;
4. Informed choice;
5. Privacy and confidentiality;
6. Safe services.

4.5 Data processing and analysis

Data processing included a number of important steps to prepare the raw data for analysis. The initial steps in data processing included: editing questionnaires in the field and in the investigator's office, prior to data entry, and complete double-data entry of all questionnaire responses to minimize error. Data were entered using SPSS (Statistical package for social sciences) version 13.0. Once all the questionnaires were transferred to electronic format, data cleaning began. The first step was to ensure 100 percent verification between the two data entry databases, using paper questionnaires to resolve any discrepancies. Next, a series of consistency and range checks were used to identify any unreasonable responses and to verify that responses adhered to skip pattern.

4.5.1 Quantitative data analysis:

Data analyses were conducted using SPSS (Statistical package for social sciences) version 13.0 and Epi Info to ensure reproducibility across software programmes. Measures of location and variability were used for analysis. The hypothesis was tested using parametric tests like t-tests chi -square statistics, multiple regression and logistic regressions. Data presentation was done in frequencies, percentages, means, tables, graphs and charts.

Scoring knowledge and attitudes:

A) Knowledge

Regarding knowledge, the questionnaire carrying 20 questions with 20 possible correct responses was used. The questions were marked out of 20 and converted to percentage. Therefore if respondents got all the 20 correct answers their score was 100%. Based on previous research done among Somalis in North Eastern Kenya and two similar studies done among Somalis living in Somaliland by UNICEF in 1999 and 2004, the cut off point for level of knowledge in this study was taken as 75%. Respondent who received a score of 75% was considered to have satisfactory knowledge while a score of less than 75% was considered to be unsatisfactory knowledge.

B) Attitude

Regarding attitude, a series of questions were used to elicit the respondent's attitudes towards prevention of mother to child transmission of HIV.

In the self-administered questionnaire, these questions were measured on a Likert-scale with respondents circling answers ranging from strongly agree to strongly disagree. A marking scheme assigning values 1 to 5 was used to analyze the responses. Five represented a positive attitude while one represented a negative attitude over the range of 1 to 5 (Likert Rensis, 1932). The highest mark a respondent could get was 70 marks and the lowest was 14 marks. A respondent who scored above 42 marks out of the possible 70 (above 60%) was said to have a positive attitude, while a

respondent who scored 36 and below (equal to or below 60%) was considered to have negative attitude toward PMTCT. Percentage scores were then calculated out of the scores each respondent got. A percentage score of above 60% was said to have a positive attitude towards PMTCT. A percentage score of less than or equal to 60% was said to have a negative attitude towards PMTCT. Sixty percent was chosen as the cut off point because an individual who selected "neutral" in all the 14 questions scored 42 marks out of the possible 70, which is equal to 60%.

4.5.2 Qualitative data analysis:

Qualitative data was used to assess level of pharmacy and supervision support offered to PMTCT services and also compliments the quantitative data on the maternal ARV uptake in Kakamega district. Qualitative data was transcribed, coded, summarized according to emerging themes and analysis was done manually according to the study objectives.

4.6 Minimization of errors and biases

The potential errors and biases were minimized by:

1. Training research assistants so as to make sure that they understood the questions well.
2. Pre-testing of the questionnaires and any ambiguity corrected before the actual collection of data through pilot study.
3. Random selection of participants.
4. The filled questionnaires were reviewed on a daily basis for completeness and to make sure that the entries were accurate.

4.7 Ethical considerations

1. Research was not conducted without the informed consent of individuals.
2. Informed written/verbal consent were given before participation in the study.
3. Assurance of confidentiality of the responses and identities.
4. The HIV positive pregnant women/mothers and their children were enrolled into HIV clinics.
5. The HIV exposed infants were tracked and followed up appropriately through referrals to existing health facilities providing HIV care as per the national protocol.
6. Participation of the clients was on a voluntary basis.
7. Clearance to carry out the study was sought from the Kenyatta National Hospital/University of Nairobi Research and Ethical Committee.

4.8 Study limitations

1. Selection bias resulted from the fact that only those who gave informed consent were included in the study. So it is not certain if those who participated in the study were true representative of the study population and if those who declined to participate were significantly different from those who participated.
2. Convenient sampling could have introduced non-probability sampling error.

CHAPTER 5: STUDY FINDINGS

Both quantitative and qualitative methods were employed in data collection. A total of 119 HIV positive pregnant women responded to the exit interview and 30 health care workers responded to the interviewee administered questionnaires. Sections 5.1 to 5.6 present results for quantitative methods while section 5.7 presents results for qualitative methods.

5.1 Socio-demographic characteristics of the sample population

5.1.1 HIV positive pregnant women

A total of 119 HIV positive pregnant women responded to the exit interviews. Table 8 summarizes their socio-demographic characteristics.

Table 5: Socio-demographic characteristics of the HIV positive pregnant women respondents (n=119).

Characteristics	Frequency n=119	Percentage
Location of origin		
Urban	31	26.1
Rural	88	73.9
Age in years		
Up to 18 years	3	2.5
18-24 years	39	32.8
24-35 years	67	56.3
Above 35 years	10	8.4
Years of stay in current residence		
5-10 years	59	49.6
11 -20 years	49	41.2
Above 21 years	11	9.2
Religion		
Christian	118	99.2
Muslim	1	0.8
Level of education		
None	9	7.6
Nursery	1	0.8
Primary	71	59.7
Secondary	35	29.4
Tertiary	3	2.5
Marital status		
Single	11	9.2
Married	107	89.9
Separated	1	0.8

Table 11: Continued...

Type of health facility		
Provincial General Hospital	26	21.8
District	15	12.6
Sub-district	8	6.7
Health centre	45	37.8
Dispensary	13	10.9
Mission Hospital	8	6.7
Mission health centre	4	3.4
District		
Kakamega South	14	11.8
Kakamega North	22	18.5
Kakamega East	34	28.6
Kakamega central	49	41.2

Out of the 119 HIV positive pregnant women interviewed 88(73.9%) came from the rural health facilities and 31(26.1%) came from the urban health facilities.

Age

The ages of the respondents ranged from 18 to 43 years with a mean age of 26.7years, median age of 26 years and a standard deviation (SD) of 4.997. (95% CI: 25.76-27.57years). There were 3(2.5%) HIV positive pregnant women who were aged 18 years, 39(32.8%) aged between 18 to 24 years, 67(56.3%) aged 24 to 35 years. 10 (8.4%) were aged above 35 years.

Length of stay

About fifty percent (59/119) of the respondents had stayed for between 5-10 years in their current residence, 49(41.2%) had stayed between 11 and 20 years while 11(9.2%) had stayed for over 21 years.

Religion

Majority 118(99.2%) of the respondents were Christians. 1 (0.8%) was a Muslim.

Level of education

Nine (7.6%) of the respondents had no formal education, 1(0.8%) had gone up to nursery school level, 71(59.7%) up to primary school level, 35(29.4%) up to secondary school level while 3(2.5%) had tertiary level of education.

Marital status

Most 107(89.9%) of the respondents were married, 11(9.2%) were single and 1(0.8%) was separated.

5.1.2 PMTCT counselors and Health facilities

A total of 30 health facilities and PMTCT counselors within the greater Kakamega district were sampled in the study. Table 6 summarizes their socio-demographic characteristics.

Table 6: Characteristics of the health care workers and health facilities (n=30).

Characteristic	Frequency n=30	Percentage
District		
Kakamega South	5	16.7
Kakamega North	6	20.0
Kakamega East	7	23.3
Kakamega Central	12	40.0
Location		
Urban	2	6.7
Rural	28	93.3
Type of hospital		
Provincial	1	3.3
District	2	6.7
Sub-district	2	6.7
Health centers	10	33.3
Dispensary	13	43.3
Mission Hospital	1	3.3
Mission HC	1	3.3
Marital status		
Single	5	16.7
Married	25	83.3
Sex		
Male	9	30
Female	21	70
Age group		
Up to 35 years	9	30
35 to 45 years	12	40
Above 45 years	9	30
Length of stay		
Up to 10 years	20	66.7
10-20 years	4	13.3
20-30 years	3	10.0
Above 30 years	3	10.0

Out of the 30 health facilities sampled, 5(16.7%) were from Kakamega South district, 6(20%) from Kakamega North district, 7(23.3%) from Kakamega East district and 12(40%) from Kakamega Central district. Two (6.7%) and twenty eight (93.3%) were from urban and rural areas respectively. One (3.3%) was a provincial hospital, 2(6.7%) were district hospitals, 2(6.7%) were sub-district hospitals, 10(33.3%) were government health centers, 13(43.3%) were government dispensaries, 1(3.3%) was a mission hospital and 1(3.3%) was a mission dispensary.

The age of the PMTCT counselors ranged from 25 to 54 years with a mean of 40.3 years with a standard deviation of 8.9.(95% CI:36.9-43.6 years). Nine 9(30%) of the PMTCT counselors interviewed were below 35 years, 12(40%) of them aged between 35 to 45 years while 9(30%) were aged above 45 years. Five (16.7%) of the PMTCT counselors interviewed were single while 25(83.3%) were married. Majority, (70%) of the PMTCT counselors were female while 9(30%) were male.

The mean length of stay in the current residence ranged from 1 to 47 years with a mean of 11.73 years and a standard deviation of 13.6. (95% CI: 6.67-16.8 years). 20(66.7%) of the counselors had stayed in their current station for less than 10 years, 4(13.3%) had stayed for a period of between 10 to 20 years, 3(10%) between 20 to 30 years while 3(10%) had stayed for over 30 years.

5.2 Quality of PMTCT counseling services

The quality of PMTCT counseling services were elicited by conducting exit interviews for the HIV positive pregnant women from the sampled health facilities. The quality of PMTCT counseling services were assessed at the following levels: counselor client interaction, counseling environment, counseling for prevention, counselor skills in phlebotomy and access to PMTCT.

Table 7: Quality of PMTCT counseling services as assessed by HIV positive pregnant women (n=19).

Characteristics	n=19	Percent
Waiting time to see the counselor		
Less 30mins	56	47.1
30mins-1hr	41	34.5
1-2hrs	15	12.6
Over 2hrs	7	5.9
Counselor client interaction		
Neutral welcome	23	19.3
Warm welcome	96	80.7
Counselor explained to you what to expect in the session	113	(95%)
Counselor felt free to talk about concerns and personal issues	113	95
Counselor listened to you	117	98.3
Counselor understood concerns and personal issues	107	89.9
Client felt that personal issues remained safe	103	86.6
Was the counselor respectful towards you	119	100
Was the counselor genuine towards you?	109	91.6
Feel the counselor was confident in his/her job	115	96.6
Did you have enough time with the counselor	98	82.4
Feel received all the necessary information you needed to know	93	78.2
The attitude of the other staff at the health facility		
Poor	2	1.7
Fair	11	9.2
Good	106	89.1

Table 11: Continued...

Counseling environment		
Visual privacy during the counseling session	115	96.6
Auditory privacy during the counseling session	114	95.8
The counseling room in a convenient place	116	97.5
Counseling for prevention		
Risk behavior discussed	105	88.2
Disclosure to partner discussed	104	87.4
Condom use discussed	94	79
The counselor was comfortable discuss with you risk behavior, disclosure and condom use	105	88.2
Condom use demonstrated	61	51.3
Counselor skills in phlebotomy		
Did you have a blood sample taken today?	113	95
How many times were you pricked		
Once	65	54.6
Twice	47	39.5
3 times	7	5.9
Feel comfortable when your sample was taken	84	70.6
Access to PMCT services		
Number of times unsuccessfully tried to get PMTCT services		
None	85	71.4
Once	28	23.5
Twice	5	4.2
3 times	1	0.8

Majority, 97(81.5%) of the respondents were seen within 1 hour while 22(18.5%) were actually seen after one hour's waiting.

5.2.1 Counselor client interaction

With respect to how respondents felt welcomed by the counselors, most 96(80.7%) of the HIV positive pregnant women were warmly welcomed, 23(19.3%) were accorded normal welcome while none was accorded a cold welcome. The study further, showed that 113(95%) of the respondents were explained to what to expect in the counseling session and also felt free to talk about their concerns and personal issues while 6(5%) were neither explained to what to expect in the counseling session nor felt free to talk about their concerns and personal issues. Furthermore, 117(98.3%) of the respondents felt that the counselors listened to them while 2(1.7%) felt they were not listened to.

Study respondents when asked if the counselor understood their concerns and personal issues. Most, 107 (89.9%) of them felt that the counselors understood their concerns and personal issues while 12(10.1%) felt that their concerns and personal issues were not understood.

The study respondents when asked if they felt their personal issues would remain safe between them and the counselors, most, 103(86.6%) of them felt that their personal issues would remain safe after the counseling session compared to 16(13.4%) who felt that their personal issues would not remain safe after the counseling sessions. All the respondents felt that the counselors were respectful towards them.

The respondents were asked if the counselors were genuine towards them. Majority, 109 (91.6%) of the respondents felt that the counselors were genuine towards them while 10(8.4%) either felt that the counselors were not genuine towards them or were not sure.

The respondents were asked if they felt counselors were confident in their job. Majority 115(96.6%) of them felt that the counselors were confident in their job while 4(3.4%) of the respondents felt they were not confident in their job. Moreover, a significant number 99(83.2%) of them felt that they had enough time with the counselors, 12(10.1%) felt that the time was too short while 8(6.7%) felt that time was too long.

The respondents when asked if they felt they received all the necessary information they needed to know, majority 93(78.2%) of them felt they received all the necessary information they needed to know while 26(21.9%) of the respondents either felt they did not receive all the necessary information they needed to know or were not sure. Majority, 106(89.1%) of the respondents felt that the attitude of the other staff at the health facility was good, 11(9.2%) felt that the attitude was fair while 2(1.7%) felt that the attitude was poor.

5.2.2 Counseling environment

The respondents were asked if they had visual and auditory privacy during the counseling sessions. One hundred and fifteen (96.6%) and 114(95.8%) of them felt they had visual and auditory privacy respectively during the counseling sessions, respectively. Most, 116(97.5%) of the respondents felt that the counseling rooms were in convenient places while a few 3(2.5%) felt that the counseling rooms were not in convenient places.

5.2.3 Counseling for prevention

One hundred and five (88.2%) of the respondents were counseled on risk behavior, 104(87.4%) of the respondents were counseled on issues of HIV disclosure, 94(79%) were counseled on condom use and nearly half 61(51.3%) of the respondents had demonstration of the condom use during the counseling sessions.

5.2.4 Counselor skills in phlebotomy

Respondents were asked if they had their blood sample taken the same day. Vast majority 113(95%) of them had blood sample taken the same day while the rest 6(5%) did not have their blood sample taken the same day. Out of the 113 respondents who had their blood sample taken on the same day, 62(54.9%) of them had their fingers pricked once by the counselor, 45(39.8%) had their fingers pricked twice while 6(5.3%) had their fingers pricked 3 times. In addition, 82(72.6%) of them felt comfortable when their blood sample were taken while 31(27.4%) did not feel comfortable.

5.2.5 Access to PMTCT services

With regard to how many times they have tried to get PMTCT services and have been unsuccessful, majority 85(71.4%) of the respondents successfully got the PMTCT services on the first visit, 28(23.5%) were successful on the second visit, 5(4.2%) were successful on the third visit while 1(0.8%) got PMTCT services successfully on the fourth visit.

When the respondents were asked if they would come back to the same health facilities for their care 117(98.3%) of them said they would go back to the same health facility for their care while 2(1.7%) said they would not go back to the same health facility for their care.

Overall, 110(92.4%) of the respondents felt that the PMTCT counseling services they received were either very good or good while 9(7.6%) felt that the PMTCT services they received was fair and no one felt it was poor.

The participant's responses were aggregated and one mark score for a positive response and zero for a negative response. The maximum possible score was 100%. The mean score for the quality of the PMTCT counseling services was 90.18% (95% CI: 89.36-90.99) with a standard deviation of 4.5. The median and mode were 92% and 93% respectively.

The facilities were scored according to proportion of pregnant HIV infected women who had received ARV prophylaxis. Facilities with over 80% score in the quality of PMTCT counseling services were categorized as having satisfactory quality of PMTCT counseling services while those with lower score were categorized as unsatisfactory quality of PMTCT counseling services.

Figure 7: The quality of PMTCT counseling services (n=19)

Quality of PMTCT counseling services

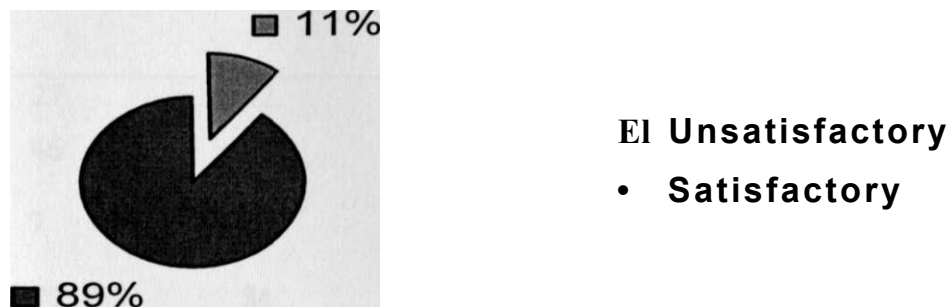


Figure 7 shows that 13(11%) of the HIV positive pregnant women had unsatisfactory quality of PMTCT counseling while 106(89%) had a satisfactory quality of PMTCT counseling services.

5.2.6 Relationship between the socio-demographic factors, quality of PMTCT counseling indicators and ARV prophylaxis uptake

Facilities with satisfactory maternal and infant ARV prophylaxis uptake were compared to those with unsatisfactory uptake for quality of PMCT counseling services as perceived by pregnant women attending these facilities to determine whether there were any associations between uptake, and quality of PMTCT counseling services.

A) **Maternal ARV prophylaxis**

Table 8 shows the bivariate analysis of the maternal ARV prophylaxis uptake.

Table 8: Results of bivariate analysis of the relationship between socio-demographic, quality of PMTCT counseling and the maternal ARV prophylaxis uptake.

Characteristics	Satisfactory maternal ARV prophylaxis	Unsatisfactory maternal ARV prophylaxis	Odds Ratio(95% confidence interval)	P value	Overall association
Age					
Up to 24 years	27	12	1 (Ref group)		X ² =1.498 p =0.683
24-35 years	46	19	0.93(0.36-2.41)	0.956	
>36 years	7	3	0.96(0.16-5.30)	0.736	
Total	80	34	0.96(0.41-2.27)	0.927	
District					
Kakamega South	14	0			X ² =19.388 p =0.000
Kakamega North	17	3	1 (Ref group)		
Kakamega East	15	19	7.18(1.54-38.02)	0.0077	
Kakamega Central	34	12	2.00(0.43-10.36)	0.524	
Total	80	34	2.41(0.61-11.10)	0.273	
Location					
Urban	26	5	1 (Ref group)		X ² =3.816 p =0.039
Rural	54	29	2.79(0.089-9.31)	0.085	
Total	80	34	0.00(0.00-0.41)	0.0013	
Level of education					
None	6	3	1 (Ref group)		X ² =0.805 p =0.938
Nursery	1	0			
Primary	49	19	0.78(0.15-4.41)	0.709	
post-primary	24	12	1.00(0.17-6.19)	0.692	
Total	80	34	0.85(0.17-4.59)	1	

Table 11: Continued...

1 Type of Hospital					
Provincial	26	0	–	–	$X^2=42.636$ $p =0.000$
District	15	0			
Sub-district	5	3	1 (Ref group)		
Health centre	29	16	0.92(0.16-	1	
Dispensary	4	4	5.69)	1	
Mission health facilities	1	11	1.67(0.15-	0.036	
Total	80	34	19.93)	0.697	
			18.33(1.13-		
			641.76)		
			0.71(0.14-4.0)		
Risk behavior					
NO	13	1	1 (Ref group)		$X^2=3.923$ $p =0.039$
YES	67	33	6.40(0.81-	0.0613	
Total	80	34	136.61)	0.11	
			5.53(0.70-		
			117.52)		
Disclosure to partner					
No	6	9	1 (Ref group)		$X^2=7.515$ $p =0.009$
YES	74	25	0.23(0.06-	0.125	
Total	80	34	0.78)	0.041	
			0.28(0.08-		
			0.96)		
Understood concerns and personal issues					
NO	12	0	1 (Ref group)		$X^2=5.7$ $p =0.011$
YES	68	34			
Total	80	34	0.85(0.46-	0.684	
			1.57)		
Counselor comfortable discuss with you					
No	13	1	1 (Ref group)		$X^2=3.923$ $p =0.039$
YES	67	33	6.40(0.81-	0.061	
Total	80	34	136.61)	0.11	
			5.53(0.70-		
			117.52)		

The maternal ARV prophylaxis uptake was rated as 100% satisfactory in Kakamega South followed by Kakamega North and Kakamega Central districts which were rated as having 85% and 74% satisfactory maternal ARV prophylaxis uptake respectively. Kakamega East district had 56% rating

as having unsatisfactory maternal ARV prophylaxis. Mission hospitals and health facilities within Kakamega East district were rated as having unsatisfactory maternal ARV prophylaxis.

Health facilities located in urban areas were rated as having 83.9% satisfactory uptake of maternal ARV prophylaxis as opposed to 65.1% of the health facilities located in rural areas. Therefore, the difference in satisfactory uptake of maternal ARV prophylaxis was statistically significantly higher among the urban health facilities than the rural health facilities (Fisher's Exact test=0.039).

With regard to how long they waited to see the counsellor, respondents who waited for between 30mins to 1 hour and 1 hour and 2 hours came from health facilities rated as having 85% and 86.7% satisfactory uptake of maternal ARV prophylaxis respectively. Those who waited for less than 30mins and for over 2 hours came from health facilities rated as having 42.9% and 57.7% satisfactory uptake of maternal ARV prophylaxis. This means that health facilities where the waiting time is too short or too long were statistically significantly associated with low uptake of maternal ARV prophylaxis ($p=0.006$).

Respondents who received neutral welcome came from health facilities rated as having 95.7% satisfactory maternal ARV prophylaxis as compared to 63.7% satisfactory maternal ARV prophylaxis uptake amongst those who received warm welcome. This means that the type of welcome is statistically significantly associated with maternal ARV prophylaxis (Fisher's Exact test=0.001).

The respondents who said counselors did not understand their concerns and personal issues came from health facilities rated as having 100% satisfactory maternal ARV prophylaxis while respondents who said counselors understood their concerns and personal issues came from health facilities rated as having 66.7% satisfactory maternal ARV prophylaxis (Fisher's Exact test=0.011).

Seventy-five percent (75%) of respondents who had disclosure of HIV status discussed came from health facilities rated as having satisfactory maternal uptake as compared with 25.3% of HIV positive pregnant women who had disclosure of HIV status discussed who came from health facilities rated as having unsatisfactory maternal ARV prophylaxis uptake. The difference was found to be statistically significant (Fisher's Exact test=0.009).

Sixty seven percent (67%) of respondents who felt that the counselors were comfortable discussing risk behavior came from health facilities rated as having satisfactory maternal ARV prophylaxis as compared to 33% of HIV positive pregnant women who felt that the counselors were comfortable

discussing risk behavior who came from health facilities rated as having unsatisfactory maternal ARV prophylaxis uptake. The difference was statistically significantly (Fisher's exact Test=0.039).

b) Infant ARV prophylaxis

Table 9 shows the bivariate analysis of the infant ARV prophylaxis uptake.

Table 9: Results of bivariate analysis of the relationship between socio-demographic, quality of PMTCT counseling and the infant ARV prophylaxis uptake.

Characteristics	Satisfactory infant ARV prophylaxis	Unsatisfactory infant ARV prophylaxis	Odds Ratio(95% confidence interval)	p -value	Overall association
Age					
13 to 24 years	14	25	1(Ref group)		
25-35 years	36	29	0.45(0.18-1.10)	0.0849	
> 36 years	8	2	0.14(0.02-0.88)	0.0319	
Total	58	56	0.54(0.243-1.22)	0.152	
District					
Kakamega South	14	0			
Kakamega North	20	0			
Kakamega East	19	15	1 (Ref group)		$X^2=62.629$ $p=0.000$
Kakamega Central	5	41	10.39(2.94-39.07)	0.000042	
total	58	56	1.22(0.53-2.83)	0.751	
Location					
Urban	0	31			
Rural	58	25	1 (Ref group)		$X^2=44.099$ $p=0.000$
total	58	56	2.24(1.18-4.25)	0.011	

Table 11: Continued...

Level of education					
None	5	4	1(Ref group)		
Nursery	1	0	–	–	
Primary	35	33	1.18(0.24-5.83)	1	$X^2=1.499$ $p=0.827$
post-primary	17	19	1.40(0.26-7.64)	0.940	
Total	58	56	1.21(0.26-5.70)	1	
Type of Hospital					
Provincial	0	26			$X^2=58.483$ $p=0.000$
District	15	0			
Sub-district	5	3	1(Ref group)		
Health centre	30	15	0.83(0.14-5.18)	1	
Dispensary	4	4	1.67(0.15-19.93)	1	
Mission health facilities	4	8	3.33(0.37-34.38)	0.409	
Total	58	56	1.61(0.31-8.99)	0.718	
Risk behavior					
NO	10	4	1(Ref group)		$X^2=2.697$ $p=0.086$
YES	48	52	2.71(0.71-11.08)	0.175	
Total	58	56	2.41(0.64-9.78)	0.242	
Disclosure to partner					
No	8	7	1(Ref group)		$X^2=0.042$ $p=0.529$
YES	50	49	1.12(0.34-3.77)	0.942	
Total	58	56	1.10(0.33-3.67)	0.924	
Understood concerns and personal issues					
No	11	1	1(Ref group)		$X^2=8.928$ $p=0.002$
YES	47	55	12.87(1.61-276.52)	0.007	
Total	58	56	10.62(1.34-227.24)	0.0166	
Counselor comfortable discuss with you					
No	13	1	1(Ref group)		$X^2=11.254$ $p=0.001$
YES	45	55	15.89(2.03-337.63)	0.002	
Total	58	56	12.55(1.62-265.42)	0.007	

Kakamega central district had the least rating with satisfactory uptake of infant ARV prophylaxis of 11% and Kakamega south and Kakamega North districts had 100% infant ARV prophylaxis satisfactory uptake rating. This means that infant ARV prophylaxis uptake is statistically significantly associated with the type of district ($p=0.000$).

Health facilities in Kakamega Central district like Kakamega PGH, Navakholo SDH, Sivilie dispensary, Bukura HC were rated as having 100% unsatisfactory infant ARV prophylaxis. Thus, the association between health facilities in Kakamega Central district and infant ARV prophylaxis were not statistically significant ($O=0.58$).

All (100%) of the health facilities in the urban areas were rated as having unsatisfactory infant ARV prophylaxis as compared to 44.6% unsatisfactory in health facilities located in the rural areas. The difference in unsatisfactory uptake of infant ARV prophylaxis was statistically significantly higher among the urban health facilities than the rural health facilities (Fishers Exact test= 0.000).

With regard to how long they waited to see the counsellor, those who waited for less than 30mins came from health facilities rated as having 63.5% satisfactory infant ARV prophylaxis and those who waited for more than 30mins came from health facilities rated as having less than 47.5% satisfactory infant ARV uptake. This means that waiting time was not statistically significantly associated with infant ARV prophylaxis uptake ($O=0.13$).

Respondents who received neutral and warm welcome came from health facilities rated as having 69.9% and 46.2% satisfactory infant ARV prophylaxis. This means that the type of welcome was statistically significantly associated with infant ARV prophylaxis uptake (Fisher's Exact test= 0.037).

With regard to infant ARV prophylaxis respondents who said counselors did not understand their concerns and personal issues came from health facilities rated as having 91.7% satisfactory uptake while those who said the counselors understood their concerns and personal issues came from health facilities rated as having 46.1% satisfactory uptake. The difference was statistically significant (Fishers exact test= 0.002).

There was no significant association between HIV disclosure and the infant ARV prophylaxis uptake ($p=0.78$).

Results of logistic regression analysis

Logistic regression was done to assess critical predictors to maternal ARV prophylaxis uptake after controlling for possible confounders: district, facility, type of health facility and risk reduction remained strong predictors to being rated as having satisfactory or unsatisfactory maternal ARV prophylaxis uptake (Table 10).

Table 10: The results of the logistic regression of the possible predictors for maternal ARV prophylaxis uptake.

Variable	Regression coefficient	Wald's statistics	Significance level	Odds ratio	95% CI
District	6.771	5.920	0.015	871.929	3.731-203743.
Facility	-0.305	5.159	0.023	0.737	0.567-0.959
Location	-2.375	1.545	0.124	0.093	0.004-1.922
Type of health facility	4.808	10.121	0.001	122.543	6.335-2370.314
Waiting time	-0.977	0.355	0.551	0.376	0.015-9.366
Welcome	10.887	0.032	0.858	53450.404	0.000-0.56
Risk reduction measures	8.336	4.535	0.033	4169.571	1.942-8951826
HIV Disclosure	-18.834	22.738	0.407	0.000	0.000-0.011

The factors found to have statistically significant influence on maternal ARV prophylaxis uptake were district, facility, type of health facility and risk reduction measures. The remaining variables namely location, waiting time, type of welcome and HIV disclosure status had no significant effect on maternal ARV prophylaxis uptake.

5.3 Quality of PMTCT services

The quality of PMTCT services were determined using a interviewee administered questionnaire that looked into different aspects of quality namely safe services, privacy and confidentiality, information, dignity, comfort and expression of opinion, continuity of care, access to services and informed choice. Table 11 shows the proportion of positive responses amongst the PMTCT counselors.

Table 11: The proportion of positive responses from 30 PMTCT counselors interviewed (n=30).

1 A) THE CLIENTS RIGHTS TO SAFE SERVICES	Frequency n=30	Percent
Clients advised on the risks and benefits for HIV testing	30	100
Clients receive information about the benefits and side effects associated with ARV prophylaxis	27	90
Use of sterile needles, lancets and syringes used	29	97
Needles and other sharp objects put in puncture-resistant containers immediately after use	30	100
All instruments cleaned with detergent solution and water	29	97
Staffs wear heavy-duty gloves to clean used instruments and to dispose of medical and hazardous chemical waste	9	30
Medical and hazardous waste disposed of by burning or burying	30	100
B) THE CLIENTS RIGHTS TO PRIVACY AND CONFIDENTIALITY		
Client counseling always done with visual privacy	26	87
Client counseling always done with auditory privacy	29	97
Examination and procedure rooms have visual privacy	27	90
Examination and procedure rooms have auditory privacy	29	97
Staffs avoid interrupting counseling and examination sessions	26	87
Staffs respect patients' and clients' requests for strict confidentiality	29	97
Staffs refrain from discussing clients with people not directly involved in the clients' care	30	100
Site have a separate record for each client	13	43
Access to client records strictly controlled	27	90
All tests and procedures done with full informed consent of the client	30	100
C) THE CLIENTS RIGHTS TO INFORMATION		
Signs showing where PMTCT services are located	13	43
At least one PMTCT poster and one HIV/AIDS or STI poster in a local language in the waiting room	8	27
Health videos, flip charts, drama or leaflets on PMTCT in the health facilities	14	47
Health talks on how HIV is transmitted and not transmitted	28	93
Health talks on the differences between HIV and AIDS	27	90
Health talks on the risks of MTCT of HIV during pregnancy, childbirth and breastfeeding	28	93
Health talks on opportunities to reduce mother to child transmission through antiretroviral treatment, appropriate antenatal, delivery and postpartum care and modification of infant feeding	29	97
Health talks on the interaction between HIV and other diseases like STIs, TB	26	87
Health talks at least once a week in the clinic that include HIV/AIDS and STIs	28	93
Health talks at least once a week in the clinic that include child nutrition (including breastfeeding for HIV positive pregnant women)	28	93
Health talks at least once a week in the clinic that include how to prevent mother to child transmission of HIV	28	93
Staff from the clinic give planned/scheduled health talks in the community	18	60

Table 11: Continued...

(D) THE CLIENTS RIGHTS TO DIGNITY, COMFORT AND EXPRESSION OF OPINION		
Client-waiting areas clean, well-ventilated and with enough seating space	23	77
Client toilets clean and well-ventilated	25	83
Staffs explain examinations or procedures (HIV testing) before and during the procedure	29	97
Staffs think that client-waiting times are reasonable	20	67
Staffs treat male clients or men who accompany their partners, in a friendly, respectful and supportive way, and make them comfortable	26	87
Clients' opinions regularly solicited at the facility (via formal or informal interviews, questionnaires, suggestion boxes etc)	24	80
E) THE CLIENTS RIGHTS TO CONTINUITY OF CARE		
Facility offers Maternal and Child Health, and Family Planning outpatient services (MCH/FP)	30	100
: Facility have (or is linked with) comprehensive care clinic services	24	80
HIV positive pregnant women who need follow-up visits told when to return	28	93
Availability of RTIs/STIs/HIV diagnosis and treatment in the facility or referrals in place (with appropriate forms) to ensure they and their partners get required services	25	83
Staff routinely give provide PMTCT counseling services to pregnant women	30	100
HIV positive women needing follow-up care or procedures given attention, even if they cannot pay or have no insurance	30	100
HIV positive pregnant women return for appointments, or told when to return	28	93
HIV positive pregnant women told how to breastfeed and obtain nutrition advise after discharge	30	100
HIV positive pregnant women told when and how to bring the child for immunization, weighing, and other well-baby services	30	100
HIV positive pregnant women who desire family planning told how to access family planning services	30	100
STI/HIV clients who need follow up visits told when to return	28	93
Clients with suspected STIs treated at the first visit(even if they may need to wait for laboratory results)	29	97
Staff help HIV positive clients to contact community support groups	27	90
Facility provides on-going counseling and care for HIV positive clients	26	87
F) THE CLIENTS RIGHTS TO ACCESS TO SERVICES		
MCH/FP services available at least 5 days per week	28	93
Provider able to counsel ANC clients on PMTCT services	29	97
ARV drugs available	26	87
Clients have the right to receive services regardless of their ability to pay or Type of insurance they have	27	90
Diagnosis and treatment/or referral of RTIs/STIs/HIV available, at least five days a week	29	97
Staff use the syndromic approach for management and treatment of STIs if diagnostic tests are not available at the site, or if there are no nearby services to refer to	29	97
Men and women can pick up condoms without consulting a provider(from a machine or basket)	19	63
L		

Table 11: Continued...

Jf.) THE CLIENTS RIGHTS TO INFORMED CHOICE		
Client always helped to determine her/his risk of HIV and STI's and are condoms actively promoted (alone or as a dual protection) for those who feel, or who appear to be, at risk	25	83
Poster that outlines or discusses the right of clients displayed where clients can see it	10	33
HIV testing offered to all antenatal clients, and all risks and benefits discussed	29	97
After PMTCT counseling, there opt-out options and clarify any issues about their choice	25	83
Clients helped to choose the type of feeding options during labor and when to administer it	28	93
The risks and benefits of breastfeeding discussed with women known to be HIV positive	30	100
Counseling include advising clients with STIs on the importance of notifying all their partners of their status (except when to do so would endanger the client)	29	97
HIV positive clients counseled about the risks of pregnancy	30	100

The quality of PMTCT services were categorized into safe services, privacy and confidentiality, information, dignity, comfort and expression of opinion, continuity of care, access to services and informed choice. In each category a checklist was used to assess the quality of PMTCT services. The PMTCT counselor's responses were aggregated and measured out of 100. The maximum possible score was 100 %.

The facilities with PMTCT counselors who scored over 80% were rated as having a satisfactory quality of PMTCT services while those health facilities whose PMTCT counselors had a lower score were rated as having unsatisfactory quality of PMTCT services. A corresponding mean score with a 95% confidence interval was ascertained under each service area.

All the seven mentioned categories of quality of PMTCT services were then aggregated to come up with the overall quality of PMTCT services. A cut-off of above 80% was used to indicate an overall satisfactory quality of PMTCT services. Table 12 summarizes the quality of services provided in the 30 health facilities sampled.

Table 12: The ratings of quality of PMTCT services per categories and the overall quality of PMTCT services from assessments done in the 30 health facilities (n=30).

Characteristics	Frequency n=30	Percentage
Quality of safe services	-	-
Satisfactory	27	90
Unsatisfactory	3	10
Mean± SD: 87.8% (95% CI: 84.7-90.9) with standard deviation of 8.21	-	-
Privacy and confidentiality	-	-
Satisfactory	26	86.7
Unsatisfactory	4	13.3
Mean± SD: 88.97% (95% CI: 84.2-93.70) with a standard deviation of 12.69		
Quality of information	-	-
Satisfactory	15	50
Unsatisfactory	15	50
Mean± SD: 75.93% (95% CI: 68.4-83.45) with a standard deviation of 20.14		
Quality of dignity, comfort and expression of opinion	-	-
Satisfactory	21	70
Unsatisfactory	9	30
Mean± SD: 81.47% (95% CI: 74.67-88.27) with a standard deviation of 18.2		
Quality of continuity of care	-	-
Satisfactory	27	90
Unsatisfactory	3	10
Mean± SD: 94.2% (95% CI: 91.1-97.4) with a standard deviation of 8.5		
Quality of access to services	-	-
Satisfactory	26	86.7
Unsatisfactory	4	13.3
Mean± SD: 89.1% (95% CI: 84.3-93.9) with a standard deviation of 12.84		
Quality of informed choice	-	-
Satisfactory	19	63.3
Unsatisfactory	11	36.7
Mean± SD: 85.23% (95% CI: 81.47-89.0) with a standard deviation of 10.08		
Overall quality of care	-	-
^Satisfactory	26	86.7
JUnsatisfactory	4	13.3

Using a cut-off of 80% quality of safe services, privacy and confidentiality, information, dignity, comfort and expression of opinion, continuity of care and access to services were generally rated as satisfactory while the quality of informed consent was rated as unsatisfactory.

With regard to overall quality of care, 26 PMTCT counselors (86.7%) rated the quality of PMTCT services as satisfactory as opposed to 4 PMTCT counselors (13.3%) who rated the quality of PMTCT services as unsatisfactory.

5.3.1 Results of the logistic regression

Logistic regression analysis was done to assess critical quality of services predictors to maternal and infant ARV prophylaxis uptake. The variables include in the analysis included safe services; privacy and confidentiality; quality of information; dignity, comfortable and expression of opinion; continuity of care; access and quality of informed choice. After controlling for possible confounders there were no predictors to unsatisfactory or satisfactory maternal or infant ARV prophylaxis uptake.

Table 13: The results of the logistic regression of the possible predictors for infant ARV prophylaxis uptake.

Variable	Regression coefficient	Wald's statistics	Significance level	Odds ratio
Safe services	19.325	0	1	0.008
Privacy and confidentiality	-20.723	0	0.999	0
Quality of information	20.329	0	0.999	0.008
Dignity, comfortable and expression of opinion	-21.023	0	0.999	0
Continuity of care	-40.336	0	0.999	0
Access	19.233	0	1	0.008
Quality of informed choice	-0.693	0.175	0.676	0.5
Consolidated quality of care	60.979	0	0.998	0.026

Variables safe services; privacy and confidentiality; quality of information; dignity, comfortable and expression of opinion; continuity of care; access and quality of informed choice had no significant effect on infant ARV prophylaxis uptake.

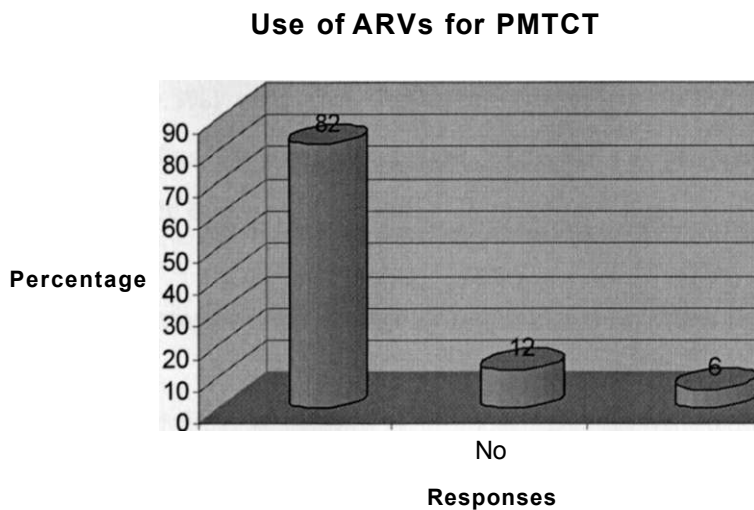
5.4 Level of awareness of HIV positive pregnant women on the use of ARV prophylaxis

One hundred and three(95%) of the respondents said that HIV can be transmitted from HIV positive pregnant woman to the child while 6(5%) respondents felt that HIV can not be transmitted from HIV positive pregnant woman to the child.

Out of the 113 respondents who said HIV can be transmitted from HIV infected pregnant woman to the child, 79(69.9%) of them said that the transmission can occur during pregnancy while 34(30.1%) either said that HIV transmission can not occur during pregnancy or did not know if it can occur during pregnancy. One hundred and six (93.8%) of the respondents said that HIV transmission can occur during delivery and breastfeeding while 7(6.2% of them either said that HIV transmission can not occur during delivery and breastfeeding or did not know if it can occur during delivery and breastfeeding.

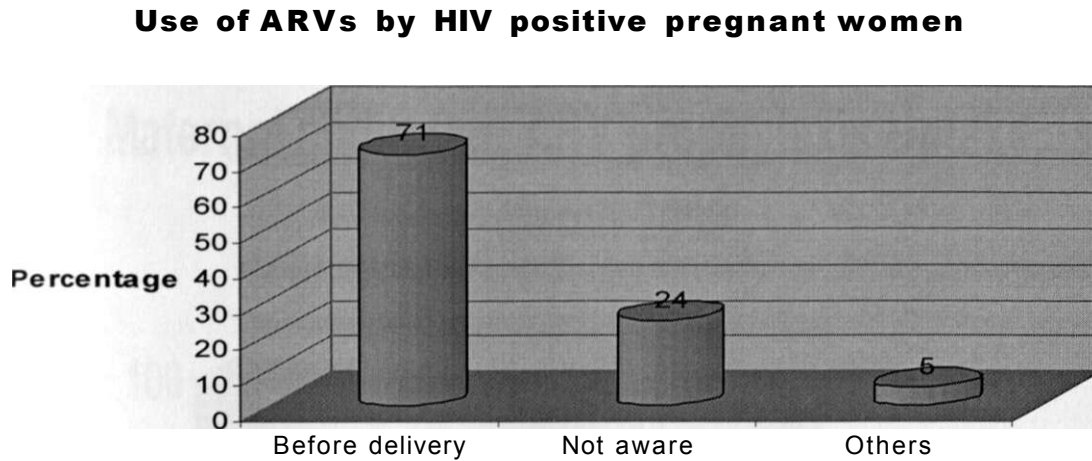
Regarding use of ARVs for PMTCT, 93(82 %) respondents said that antiretroviral drugs can be used for prevention of mother to child transmission of HIV, 13(12%) said antiretroviral drugs are of no use while 7(6%) did not know if the antiretroviral drugs can be used for PMTCT (Figure 8).

Figure 8: Percentage on knowledge of respondents on the use of ARVs for PMTCT (n=113).



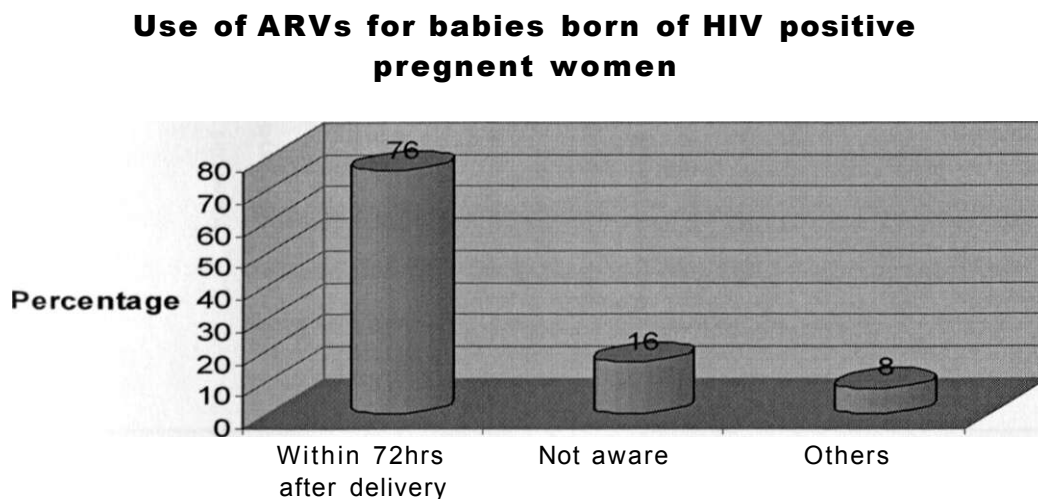
Amongst the respondents who said HIV can be transmitted from HIV positive pregnant woman to the child, 66(71%) said that ARVs are provided to the mother before delivery, 22(23.7%) said that they are not aware when ARVs are provided while 5(5.4%) gave various reasons such as on doctors prescription, during breastfeeding, follow instructions and anytime as per the client decision (Figure 9).

Figure 9: Percentage on knowledge of respondents on when to use ARVs for PMTCT (n=93).



Amongst the respondents who said HIV can be transmitted from HIV positive pregnant woman to the child, 71(76.3%) said that ARVs are provided to the baby within 72hrs after delivery, 15(16.1%) said that they are not aware when ARVs are provided while 7(7.5%) gave various reasons such as at the onset of labor and at 28 months of age.

Figure 10: Percentage on knowledge of respondents on when to use ARVs for HIV exposed babies (n=93).



5.5 ARV prophylaxis uptake

The maternal and infant ARV prophylaxis uptake was extracted from the facility's monthly reports submitted to the Ministry of Health for the period covering January to March 2009. Twenty five health facilities out of the thirty sampled for the study had HIV positive pregnant women identified

during the study period. Each facility's maternal and infant ARV prophylaxis was as shown in Figures 11 (a) and 11 (b).

Figure 11(a): Maternal and infant ARV prophylaxis uptake for Jan-March 2009 period.

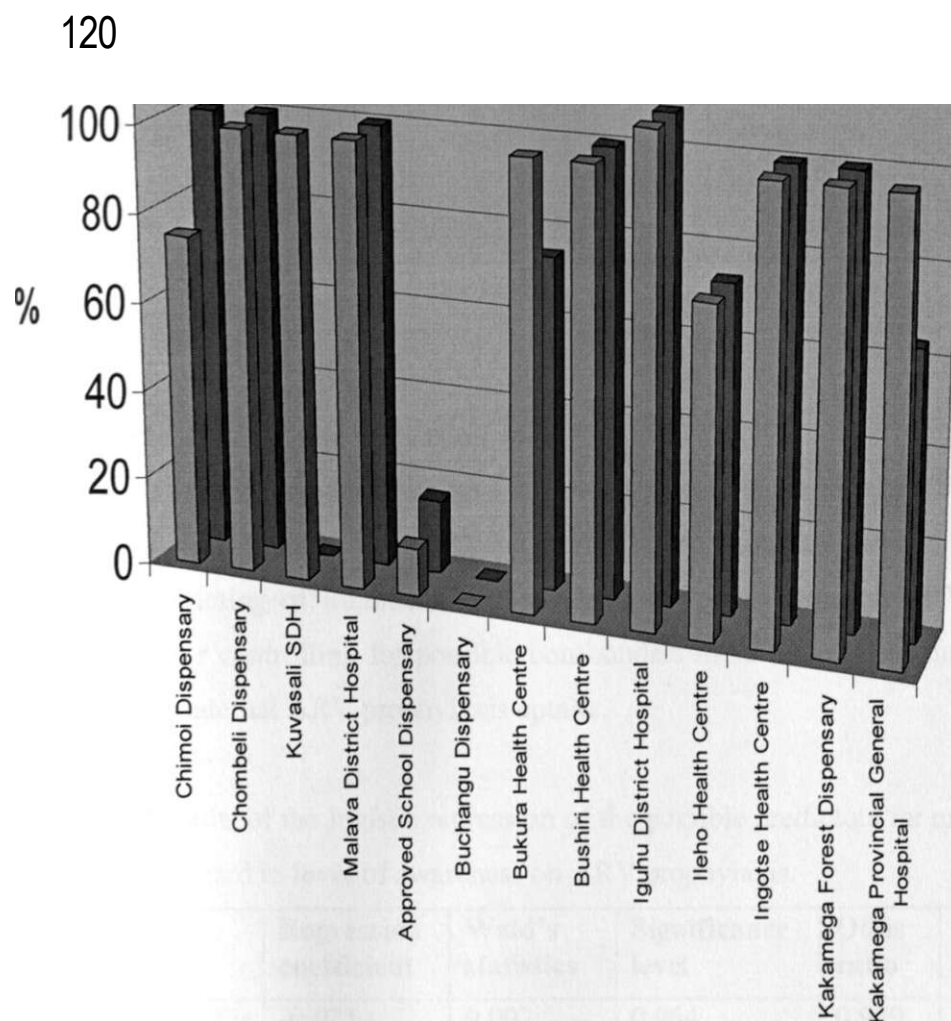
Maternal and Infant ARV prophylaxis Uptake, Jan March 2009



The X-axis represents maternal and infant ARV prophylaxis uptake (%) and the Y-axis represents the health facilities.

Figure 11(b): Maternal and infant ARV prophylaxis uptake for Jan-March 2009 period.

Maternal and Infant ARV prophylaxis, Jan-March 2009



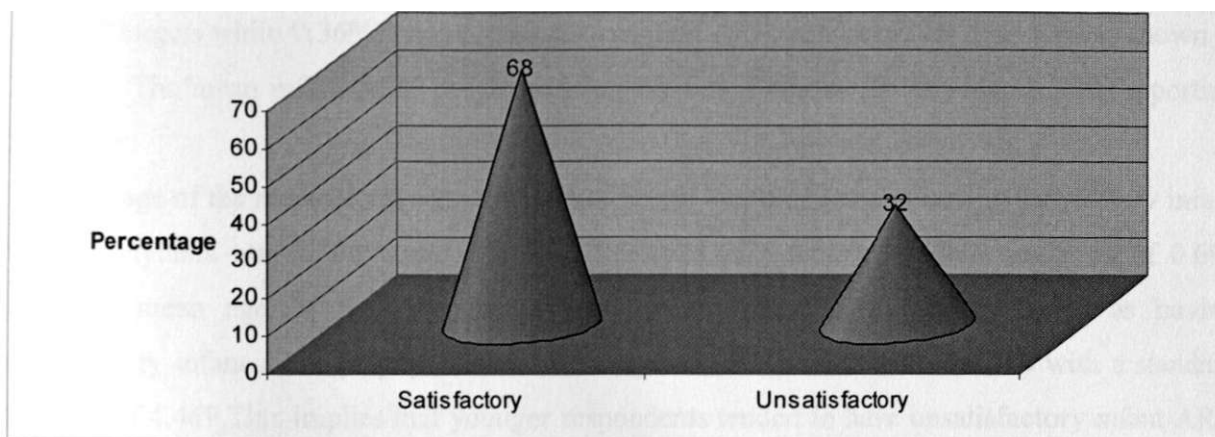
The X-axis represents maternal and infant ARV prophylaxis uptake (%) and the Y-axis represents the health facilities.

5.5.1 Maternal ARV prophylaxis

Amongst the twenty five health facilities that tested HIV positive pregnant women, 17(68%) of the health facilities had satisfactory maternal ARV prophylaxis uptake of over 80% as per the NASCOP targets while 8(32%) had unsatisfactory maternal ARV uptake of less than 80% as shown in Figure 12. The mean maternal ARV prophylaxis uptake was 87.5% for the Jan-March 2009.

Figure 12: Ratings in percentage of maternal ARV prophylaxis uptake, Jan-March 2009(n=25).

Maternal ARV prophylaxis Uptake,Jan-March 2009



5.5.1.1 Results of logistic regression analysis

Logistic regression was done to assess critical predictors to maternal ARV prophylaxis uptake with regard to level of awareness on ARV prophylaxis. The variables included timing for maternal ARV prophylaxis, timing of infant ARV prophylaxis and knowledge on ARV use for prophylaxis in PMTCT. After controlling for possible confounders there were no predictors to unsatisfactory or satisfactory maternal ARV prophylaxis uptake.

Table 14: Results of the logistic regression of the possible predictors for maternal ARV prophylaxis uptake with regard to level of awareness on ARV prophylaxis.

Variable	Regression coefficient	Wald's statistics	Significance level	Odds ratio	95% CI
Timing for maternal ARVs	-0.021	0.002	0.964	0.979	0.397-2.414
Timing of infant ARVs	0.108	0.055	0.815	1.114	0.452-2.741
Knowledge on ARV use for PMTCT	0.103	0.071	0.791	1.109	0.517-2.379

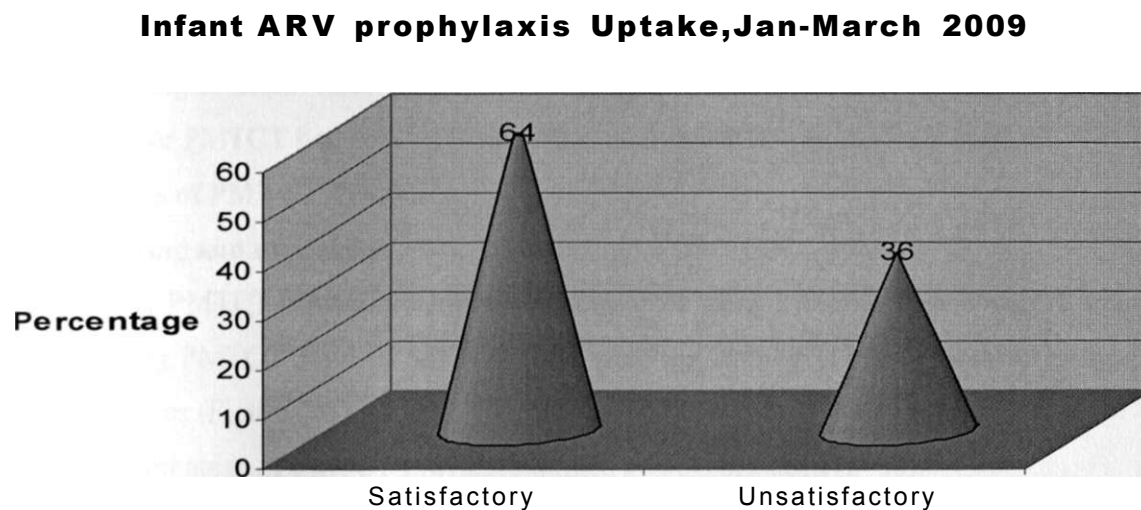
Variables namely timing for maternal ARV prophylaxis, timing of infant ARV prophylaxis and knowledge on ARV use for prophylaxis in PMTCT had no significant association with the level of awareness on ARV prophylaxis.

5.5.2 Infant ARV prophylaxis

Amongst the twenty five health facilities that identified HIV positive pregnant women, 16(64%) of the health facilities had satisfactory infant ARV prophylaxis uptake of over 80% as per the NASCOP targets while 9(36%) had unsatisfactory infant ARV uptake of less than 80% as shown in Figure 13. The mean infant ARV prophylaxis uptake was 77% for the Jan-March 2009 reporting period.

The mean age of the respondents who came from health facilities rated as having satisfactory infant ARV prophylaxis was 27.74years (95% CI: 27.048-28.432) with a standard deviation of 0.692 while the mean age of the respondents who came from health facilities rated as having unsatisfactory infant ARV prophylaxis was 25.66 years (95% CI: 25.039-26.281) with a standard deviation of 4.469. This implies that younger respondents tended to have unsatisfactory infant ARV prophylaxis. This relationship was statistically significant ($p=0.028$).

Figure 13: Ratings in percentage of infant ARV prophylaxis uptake, Jan-March 2009 (n=25).



Among health facilities rated as having satisfactory infant ARV prophylaxis, 87.9% were also rated as having satisfactory maternal ARV prophylaxis as compared to 12.1% rated as having unsatisfactory maternal ARV prophylaxis (Fisher's Exact Test=0.000). This means that there is a positive association between satisfactory maternal and infant ARV prophylaxis. This association was statistically significant.

5.5.2.1 Results of logistic regression analysis

Logistic regression was done to assess critical predictors to infant ARV prophylaxis uptake

regarding the level of awareness on ARV prophylaxis. The variables included timing of infant ARV prophylaxis, timing of maternal ARV prophylaxis and knowledge on ARV use for PMTCT. After controlling for possible confounders there were no predictors to unsatisfactory or satisfactory infant ARV prophylaxis uptake.

Table 15: Results of the logistic regression of the possible predictors for infant ARV prophylaxis uptake with regard to the level of awareness on ARV prophylaxis.

Variable	Regression coefficient	Wald's statistics	Significance level	Odds ratio	95% CI
Timing of infant ARV prophylaxis	-0.085	0.039	0.844	0.918	0.393-2.145
Timing of maternal ARV prophylaxis	-0.688	2.56	0.11	0.503	0.216-1.167
Knowledge on ARV use for PMTCT	0.008	0	0.984	1.008	0.486-2.088

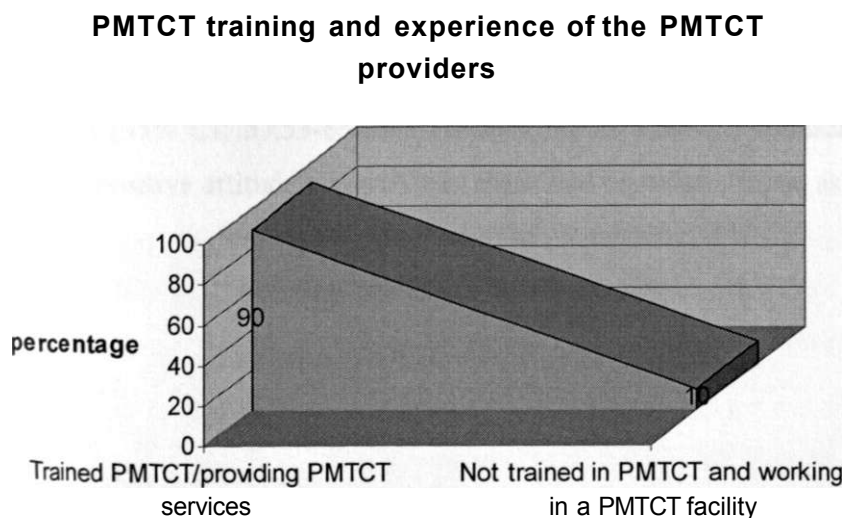
Variables timing of infant ARV prophylaxis; timing of maternal ARV prophylaxis and knowledge on ARV use for PMTCT had no significant effect on infant ARV prophylaxis uptake.

5.6 Results of PMTCT Providers

5.6.1 Training and experience

Out of the 30 PMTCT counselors interviewed most of them 27(90%) were PMTCT trained and were providing PMTCT services while 3(10%) were not trained but were working and providing PMTCT services (Figure 14).

Figure 14: Percentage of PMTCT providers trained and experienced (n=30).



5.6.2 Level of knowledge

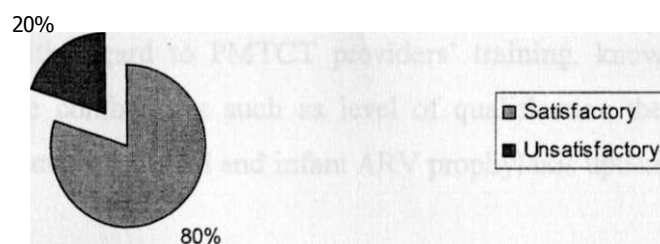
The level of knowledge was determined using a 20-item questionnaire and the cut off for the level of knowledge was taken as 75%.

The PMTCT scores ranged from 45% to 95% with a mean of 77.17% and a standard deviation of 10.4. (95% CI: 73.28-81.05%). Out of the 30 PMTCT counselors interviewed 24(80%) of them had a satisfactory PMTCT knowledge while 6(20%) of them had unsatisfactory knowledge as shown in Figure 15.

The mean age for PMTCT counselors with satisfactory knowledge was 39 years as compared with 44 years for those who had unsatisfactory knowledge. However, this was not statistically significant at 95% confidence interval ($p=0.304$).

Figure 15: Percentage of level of knowledge of PMTCT providers on PMTCT (n =30).

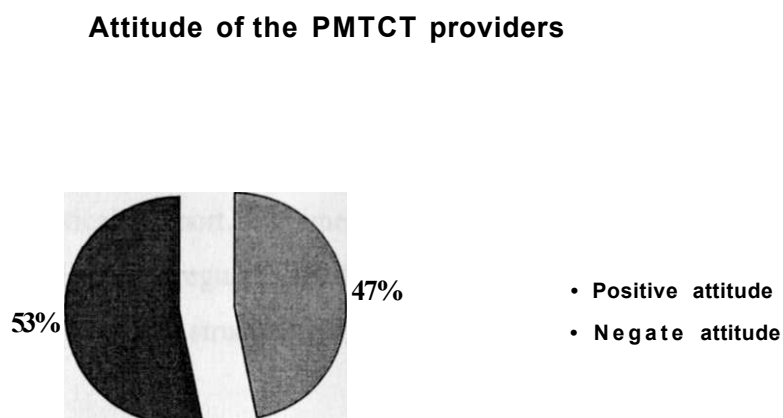
Level of Knowledge of PMTCT providers on PMTCT



PMTCT Providers' attitude

The attitude towards prevention of mother to child transmission of HIV was elicited using a self-administered questionnaire and the responses were measured on a likert-scale over the range of 1 to 5. The attitude scores ranged from 39% to 91% with a mean of 62.13% and a standard deviation of 12.3 with a (95% CI: 57.53-66.73%). Out of the 30 PMTCT counselors interviewed 14(47%) of them had a positive attitude while 53% of them had negative attitude as shown in Figure 16.

Figure 16: Attitude of the PMTCT providers (n=30).



Results of the logistic regression analysis

Logistic regression analysis was done to assess critical predictors to maternal and infant ARV prophylaxis uptake, with regard to PMTCT providers' training, knowledge and attitude. After controlling for possible confounders such as level of qualification there were no predictors to unsatisfactory or satisfactory maternal and infant ARV prophylaxis uptake.

5.7 Qualitative analysis

The following were the findings from the Key informant interviewees.

5.7.1 Pharmacy support

Interviews with the key informants revealed that three districts (Kakamega Central, Kakamega South and Kakamega North) have either a pharmacist or a pharmaceutical technologist in-charge of drug management including ARV drugs with the exception of Kakamega East district which did not have pharmacy personnel since it was newly created. Consequently, at the provincial and district level (except Kakamega East district) there is good pharmaceutical support with regard to antiretroviral drugs and the related consumables. There is steady supply of the ARVs and regular sensitization meetings on ARV commodity management including ordering, storage and dispensing of ARV drugs. At the facility level the PMTCT counselors are provided with regular on job training on commodity management through APHIA II Western project, USAID-funded project. There were no reported stock outs of the Nevirapine and/or AZT for the last 6 months in all the sampled health facilities. The inventory checklist showed that all the 30 health facilities had stocks of the Nevirapine and /or AZT with the related consumables.

5.7.2 Supervision support

Results from the key informants showed that the DHMT and APHIA II Western project staffs are involved in supervision of the PMTCT services in all the four districts. However, the DHMT in Kakamega East district have inconsistent PMTCT supervision due to inadequate funding and lack of adequate logistical support. Kakamega South, Kakamega Central and Kakamega North districts have a more active and regular DHMT supervision. The supervision is done quarterly in these districts though there is no structured PMTCT supervision tool/checklist in use.

The national PMTCT guidelines were not seen at the DASCO's offices and the DASCO for Kakamega East district reported not having seen the latest national PMTCT guidelines. Nonetheless, it's important to note that the DHMT's and the facility-in-charges interviewed were conversant with the current national PMTCT guidelines.

CHAPTER 6: DISCUSSION

Human Immunodeficiency Virus (HIV) transmission from mother to child in Kenya is one of the biggest health and development challenges in Kenya. However, PMTCT is one of the cornerstones for early access to prevention, care and support services to the mother, baby and the rest of the family members. Current strategies on HIV/AIDS in Kenya are geared towards improving the health of the HIV infected mother and reducing the transmission to their children during pregnancy, labor, delivery, and post-delivery through breastfeeding as outlined in the National HIV/AIDS Strategic Plan 2000-2004 and the National Prevention of Mother-to-Child Transmission Strategic Plan (Ministry of Health, 1999b). This study sought to assess the institutional factors that affect the uptake of ARV prophylaxis in Kakamega district. In this chapter the major issues that emanated from the findings are discussed and based on these findings conclusions and recommendations were made.

6.1 Socio-demographic characteristics

The study findings noted that 88(73.9%) of the HIV positive pregnant women came from rural health facilities while 31(26.1%) came from the urban health facilities. This compares with the KAIS 2007 which depicted that about three quarters of Kenyans live in rural areas of the country. Though the prevalence in rural areas is lower than in urban areas, the greatest burden of disease is in rural areas since most Kenyans live in rural areas.

Urban health facilities were almost 3 times more likely to be rated as having a satisfactory maternal ARV prophylaxis as compared to the rural health facilities ($p=0.039$). This was attributed to the fact that women from urban health facilities were better educated compared to their counterparts from the rural health facilities.

The results from this study revealed that most socio-demographic characteristics do not affect the uptake of either maternal or infant ARV prophylaxis. The only socio-demographic characteristics that were significantly associated with either maternal or infant ARV prophylaxis uptake were district, facility, type of health facility and age.

Kakamega East district was newly created district with new DHMT members and its administration is not yet fully in place and the DHMT supervision is irregular as compared to the much older districts. Kakamega East district has an incompletely constituted DHMT and the health facilities

have acute staff shortage and generally the health care service delivery including PMTCT services is hampered. According to Ayisi (2007), the district approach to PMTCT supervision is one of the key elements to success that needs to be replicated. This district approach to supervision is implemented more in Kakamega North and Kakamega South districts and less in Kakamega East district. This explains why Kakamega East district was 7 times more likely to be rated as having unsatisfactory maternal ARV prophylaxis uptake as compared to Kakamega North district ($p=0.0077$). In addition, key informant interviews held showed that DHMT and APHIA II Western project staffs were involved in PMTCT supervision. However, the DHMT in Kakamega East district have inconsistent PMTCT supervision due to lack of adequate logistical support. This was likely to contribute to the low maternal ARV prophylaxis in the district. Kakamega South, Kakamega Central and Kakamega North districts in comparison had a more active and regular DHMT supervision and consequently a higher maternal ARV prophylaxis uptake.

The type of facility was significantly associated with maternal ARV prophylaxis with the provincial and district hospitals rated higher with regard to satisfactory maternal ARV prophylaxis as compared to the sub-district, health centers and dispensary health facilities while mission health facilities had the lowest rating with regard to maternal ARV prophylaxis uptake ($p=0.000$). In fact Mission health centers were 5 times more likely to be rated as having unsatisfactory maternal ARV prophylaxis as compared to the sub-district hospitals. This is because the high volume sites, provincial and district hospitals started implementing PMTCT services much earlier, generally tend to have more staff as compared to the lower health facilities and mission hospitals. In addition, the provincial and district hospitals are better supervised by the District Health Management Team (DHMT) due to the close proximity to the DHMT offices and therefore easy access and less logistical problems as compared to the peripheral health facilities in the rural areas. AIDS, Population Health Integrated Assistance Program Western Province (APHIA II Western project) also tended to give more attention to the high volume sites due to the interest they generate from funding donor. AIDS, Population and Health Integrated Assistance II (APHIA II) Western is a four-year cooperative agreement between United States Agency for International Development (USAID) and Program for Appropriate Technology in Health (PATH) with the goal of promoting the adoption of healthier behaviors among Western Province residents, increase use of HIV/AIDS health services and expand use of other health services.

Human Immunodeficiency Virus (HIV) positive pregnant women aged 18-24 years were 4 times more likely to come from health facilities rated as having satisfactory infant ARV prophylaxis as compared to those aged 18 years. HIV positive pregnant women who attended health facilities that were rated as having satisfactory infant ARV prophylaxis were more likely to be older than those

who attended health facilities rated as having unsatisfactory infant ARV prophylaxis with a mean age of 27.74 years and 25.66 years respectively ($p=0.028$). This is probably due to the fact that older women are more likely to have had previous pregnancies and therefore they are more likely to have had previous PMTCT counseling experience.

6.2 Quality of PMTCT counseling services

Prevention of mother-to-child-transmission (PMTCT) of HIV infection is a scientifically accepted approach to reduce the impact of HIV, especially on the children. Prevention of mother to child transmission (PMTCT) is now viewed as a key HIV prevention strategy world wide. As the availability of PMTCT services continues to grow, issues associated with quality of PMTCT services have emerged that need to be addressed as these services are scaled up. Poor counseling or lack of counseling means that HIV positive pregnant women lack awareness on PMTCT opportunities, which limited their access to these services. Many studies have been done on the best practices in delivering and scaling up PMTCT services. Barbara *et al* (2006) in Wrap up of Implementation Experience and report from support supervision concluded that some of the best practices in PMTCT included training of HCWs in PMTCT, motivation of mothers e.g. provision of ARVs, reduced waiting time, confidentiality, regular support supervision from districts. However in the study training of the HCW on PMTCT, the time client waited to see the counselor, welcoming of the client or visual and auditory privacy had no significant associations with the uptake of maternal and infant ARV prophylaxis.

The study findings depicted that 92.4% of the HIV positive pregnant women felt that the PMTCT counseling services they received were either very good or good while 9(7.6%) of the respondents felt that the PMTCT services they received was fair and none felt it was poor, similarly 93(78.2%) of the HIV positive pregnant women felt they received all the necessary information they needed to know and most of the HIV positive pregnant women 80.7% were warmly welcomed, 23(19.3%) were accorded normal welcome while none was accorded a cold welcome. This was reflected by the fact that almost all 117(98.3%) of the HIV positive pregnant women said they would go back to the same health facility for their care. This compares with findings from Winfreda *et al* (2007) which revealed that women were satisfied with counseling services and most (89%) stated that offering routine testing is helpful. Similarly, Peltzer *et al* (2005) when assessing the factors influencing the utilization of prevention of mother-to-child transmission (PMTCT) services by pregnant women in the Eastern Cape, South Africa demonstrated that evaluations of the PMTCT services in the clinics appeared fairly positive. Almost 100% of women felt the counseling was excellent and that they received adequate information on all aspects of PMTCT. Still, many would have liked more time

with the counselor. More than 90% felt that the staffs were friendly. This was born out by all the participants agreeing that if they were in the same situation they would come back to the clinic for the same services.

The study findings revealed that majority 97(81.5%) of the HIV positive pregnant women, were seen within 1 hour while 22(18.5%) were actually seen after one hour. This contrasted with the study done by Moth *et al* (2005) in assessing the utilization of prevention of mother-to-child transmission (PMTCT) services among mothers registered for services at Nyanza Provincial Hospital in Kenya which indicated that 96% waited for more than 90 minutes and 89% took less than 10 minutes for post-test counseling .thirty percent (30%) of the respondents waited for more than 270 minutes, nearly half (38%) waited for more than 180 minutes, 28.1% waited between 91 and 180 minutes, and only 3.9% waited for less than 90 minutes. The average waiting time was 240 minutes.

Risk-reducing behavior as a patterned human social behavioral response is an attempt to adapt to, cope with, and defend against HIV disease. The importance of understanding factors related to risk reduction lies in the recognition that only when we understand the predictors that result in safer behavior change will we be able to successfully implement educational initiatives and procedures to reduce the risk of infection to individuals not yet infected with HIV as well as to reduce the risk of those infected infecting others. Risk reduction in HIV test counseling focuses on sexual behavior. Risk reduction involves discussing increasing condom use with main and/or non-main partners, intent to reduce number of sexual partners, enhancing partner communication and sexual negotiation, monogamy, abstinence, sexual activities that don't involve exchange of blood, semen or vaginal secretions, discussion with partner(s) to negotiate risk-reducing activities, partner testing, reducing use of alcohol and/or drugs among others.

Disclosure of HIV sero-status to sexual partners supports risk reduction and facilitates access to prevention and care services for people living with HIV/AIDS. HIV disclosure to partners is important to ensure ARV adherence as well as social support. The study revealed that risk reduction was 6 times more likely to be discussed in health facilities rated as having satisfactory maternal ARV prophylaxis as compared to health facilities rated as having unsatisfactory maternal ARV prophylaxis uptake (Fisher's exact Test=0.039). Similarly, HIV disclosure to partners was less likely to be discussed in health facilities rated as having unsatisfactory maternal ARV prophylaxis as compared to health facilities rated as having satisfactory maternal ARV prophylaxis uptake(Fisher's Exact test=0.009). This compares favorably with study done by Nuwagaba-Biribonwoha *et al* (2007) which revealed that one of the main challenges in implementing the

prevention of mother-to-child HIV transmission services (PMTCT) in Uganda was non-disclosure of HIV status. This study demonstrated that risk reduction and disclosure to partner were some of the determinants significantly associated with maternal ARV prophylaxis uptake. Similarly, Medley *et al* (2004) concluded that low rates of HIV sero-status disclosure reported among women in antenatal settings have several implications for prevention of mother to child transmission programmes as the optimal uptake to such programmes is difficult for women whose partners are unaware and therefore not supportive. Amy *et al* (2005) mentioned that across Durban, Paarl and Rietvlei most women are not disclosing, making it difficult for them to adhere to infant feeding advice and also receive support. Similar findings were demonstrated by Moth *et al* (2005) in assessing the utilization of prevention of mother-to-child transmission (PMTCT) services among mothers registered for services at Nyanza Provincial Hospital in Kenya revealed 95% did not disclose positive HIV status to spouses/relatives for fear of stigma, discrimination and violence. Nduati *et al* (2002) concluded that training on PMTCT led to improved provision of counseling/health education on maternal and infant nutrition, as well as information on MTCT transmission of HIV and HIV risk reduction.

The study established that over 95% of the HIV positive pregnant women felt that they had visual and auditory privacy during the counseling sessions. This compares favorably with study done by Moth *et al* which revealed that privacy in counseling rooms was considered good by most clients (97%), as indicated by a closed door and the presence of only 2 people in the room.

6.3 Level of awareness of HIV positive pregnant women on the use of ARV prophylaxis

Majority 95% of the HIV positive pregnant women knew that HIV can be transmitted from HIV positive pregnant woman to the child. This compares with study done by Gondi *et al* (2002) which concluded that the majority of clinicians seemed relatively knowledgeable regarding MTCT with 100% awareness of the risk of HIV transmission through pregnancy and 94% for breastfeeding. Similarly, Thu *et al* (2008) demonstrated that among the 52 women interviewed, there were 15 who either lacked knowledge about the infection and testing (8) or had never thought about their own risk of infection (7). This compares favorably with a study done by Family Health International (2006) which showed that 84% of the respondents knew that HIV can be transmitted from HIV positive mother to unborn baby. Moth *et al* (2005) in assessing the utilization of prevention of mother-to-child transmission (PMTCT) services among mothers registered for services at Nyanza Provincial Hospital in Kenya revealed that knowledge on MTCT and PMTCT was inadequate even after counseling, as participants could not recall the information divulged during counseling. He then concluded that inadequate counseling services delivered to clients affected service utilization.

Furthermore, the study demonstrated that more than 80% of the HIV pregnant women knew that antiretroviral drugs can be used for prevention of mother to child transmission of HIV. This study further demonstrated that amongst the HIV positive pregnant women who knew that HIV can be transmitted from HIV positive pregnant woman to the child, 66(71%) said that ARVs are provided to the mother before delivery, 22(23.7%) said that they are not aware when ARVs are provided. Of the 113 HIV positive pregnant women who said HIV can be transmitted from HIV infected pregnant woman to the child, 79(69.9%) of them said that the transmission can occur during pregnancy. Amongst the respondents who said HIV can be transmitted from HIV positive pregnant woman to the child, 71(76.3%) said that ARVs are provided to the baby within 72 hours after delivery. However, after controlling for the confounding factors, there was no significant association between the level of awareness on use of ARVs for PMTCT. This compares with KDHS (2008-9) which showed that 7 in 10 women and men knew that the risk of maternal to-child transmission can be reduced by the mother taking certain drugs during pregnancy. In contrast, Thu *et al* (2008) demonstrated that most of the women were not aware that medication could prevent MTCT. This compares favorably with a study done by Family Health International (2006) which showed that 74% mentioned taking drugs before delivery/during labor as one of the actions mother can take to prevent transmission to unborn baby. Jebessa *et al* (2005) found out that 64.6% of the postnatal mothers knew the protective effect of prophylactic anti-retroviral drugs. Moreover, Thu (2008) in assessing obstacles and challenges in HIV counseling and testing for pregnant women at antenatal clinics, concluded that while Nevirapine has been introduced nationwide, little time for counseling and inadequate information on PMTCT was given, including ARV prophylaxis. According to KDHS Survey (2003) knowledge of specific actions that mothers could take to prevent mother to child transmission was low, and less than 1/3 of respondents in all age groups suggested that medications could reduce transmission of HIV from mother to infant. Thus, the level of awareness on the use of ARVs was fairly high compared to studies done elsewhere.

Key informant interview also revealed that HCWs routinely counsel on HIV positive pregnant women on the use of ARVs and provide the ARV drugs and this correlates with the significantly high level of awareness of HIV positive pregnant women on the use of ARV prophylaxis.

6.4 ARV prophylaxis uptake

To reduce the impact of HIV infection on pregnant women and their babies, women who are HIV positive require a standard type of care before, during and after delivery, which includes HIV testing and ARV prophylaxis for both mother and infant. In this study, amongst the twenty five health facilities that identified HIV positive pregnant women, 17(68%) of the health facilities had satisfactory maternal ARV prophylaxis uptake of over 80% as per the NASCOP targets while

8(32%) had unsatisfactory maternal ARV uptake of less than 80%. The mean maternal ARV prophylaxis was 87.5% for the Jan-March 2009. Thu *et al* (2008) demonstrated that among the 52 women, only 23 (44%) mother-child pairs received ARV prophylaxis, while 20 pairs did not receive any prophylaxis at all. One reason for this disappointing record was that in many health care facilities, the ARV was not consistently available. Often even single dose NVP for women who were tested only at the time of labor was lacking. Even in the two PMTCT sites in the city, stock-out of ARV every few weeks was observed. Ruslan *et al* (2006) in Ukraine, noted that in 2002 approximately 91% of HIV-positive pregnant women received ARV prophylaxis (mainly single-dose nevirapine or short-course zidovudine) for PMTCT. Similarly, according to Delvaux (2008), in Rwanda in 2007 the maternal ARV prophylaxis stood at 90% nationally. A study by Amornwichee *et al* (2002), of the 6646 HIV-sero-positive women giving birth, 4659 (70.1%) received prophylactic antiretroviral drugs before delivery. A report by Kak *et al* (2004) estimated that 74% and 45% of HIV positive women received ARV prophylaxis in a study done in 22 sites in Tanzania and Tholo District Hospital in rural Malawi, respectively.

The study demonstrated that 64% of the health facilities had satisfactory infant ARV prophylaxis uptake of over 80% as per the NASCOP targets while 36% had unsatisfactory infant ARV prophylaxis uptake of less than 80%. The mean infant ARV prophylaxis uptake was 77% for the Jan-March 2009 reporting period which is similar to findings from Delvaux (2008) showed that in Rwanda in 2007 the infant ARV prophylaxis stood at 75%, nationally. However, Buchangu, Sivilie and Kuvasali dispensaries had the lowest infant ARV prophylaxis due to shortages of the ARV syrup formulations during the study period. Generally all the sampled health facilities had adequate and consistent amounts of the maternal and infant ARVs. A study by Pornsinee *et al* (2002) demonstrated that of 6475 neonates of HIV-sero-positive women, 5741 (88.7%) received prophylactic antiretroviral drugs. A report by Lily *et al* (2004) estimated that 41% and 34% of HIV exposed babies received ARV prophylaxis in a study done in 22 sites in Tanzania and Tholo District hospital in rural Malawi. However, among health facilities rated as having satisfactory infant ARV prophylaxis, 87.9% were also rated as having satisfactory maternal ARV prophylaxis as compared to 12.1% rated as having unsatisfactory maternal ARV prophylaxis (Fisher's Exact Test $p=0.000$). This shows that there maternal ARV prophylaxis uptake affects the infant ARV prophylaxis uptake positively.

Overall there was relatively high maternal and infant ARV prophylaxis uptake of 87.5% and 77% respectively in Kakamega district as compared to the national level of 64.1% and 56% for maternal and infant ARV prophylaxis respectively. This could be attributed by the fact that 89% of the HIV positive pregnant women interviewed rated the PMTCT counseling services as satisfactory with all

Patients feeling respected by the counselors and this could have affected both maternal and infant ARV prophylaxis uptake positively. Secondly, there was generally high quality of PMTCT services with 86.7% of the health facilities sampled having satisfactory quality of PMTCT services as compared to 13.3% of the health facilities having unsatisfactory quality of PMTCT services. This coupled with good pharmacy as well as supervisory support from the district contributed to the relatively high maternal and infant ARV prophylaxis uptake.

Consensus of the key informant interviews showed that at the provincial and district level there is good pharmaceutical support with regard to antiretroviral drugs and the related consumables and there were no reported stock-outs for the ARV commodities and that ARV drugs readily available. This also explains the high maternal ARV uptake as shown in the review of the hospital records.

6.5 PMTCT providers' training and experience, knowledge and attitude

PMTCT training is critical in scaling up of PMTCT services as well as ensuring PMTCT counselors are able to provide quality PMTCT counseling services to pregnant women. In the study 27 (90%) of the PMTCT counselors interviewed were PMTCT trained and were providing PMTCT services while 3(10%) were not PMTCT trained but were working and providing PMTCT services. The key informant interview conducted also revealed that most staffs working in PMTCT program are trained in PMTCT. However this had no significant association on the uptake of either maternal or infant ARV prophylaxis. This contrasts with study done by Msuya *et al* (2004) which concluded that comprehensive PMTCT training of frontline health workers improves significantly PMTCT services delivery in lower level health facilities.

This study revealed that 24(80%) of the PMTCT counselors interviewed had a satisfactory PMTCT knowledge while 6(20%) had unsatisfactory PMTCT knowledge. It also showed that the PMTCT mean score on a 20-item knowledge test was 77.17% correct (95% CI: 73.28-81.05%). This compares with the study conducted by Creek *et al* 2004 revealed that nearly all PMTCT counselors (90%) had formal PMTCT training with a mean score on a 24-item knowledge test was 71% correct.

The mean age for PMTCT counselors with satisfactory knowledge was 39 years as compared with 44 years for those who had unsatisfactory knowledge. However, this was not statistically significant at 95% confidence interval ($p=0.304$).

The study demonstrated that of the 30 PMTCT counselors interviewed 14(47%) of them had a positive attitude while 16(53%) of them had negative attitude. The attitude scores ranged from 39% to 91% with a mean of 62.13% (95% CI: 57.53-66.73%) which means that on average the PMTCT counselors had negative attitude towards PMTCT. In contrast, Gondi *et al* (2002) found out that 94 % of the clinicians indicated that HIV patients deserve same quality of care as other patients and 80% felt they should be respected equally. Yet, survey results demonstrated that their attitudes and practices counter these general beliefs. 54 % preferred working in a ward without HIV patients, 83 % felt more sympathetic towards those who acquired HIV from blood than sex, and 17 % believed God was punishing those infected with HIV. Similarly, Inoue *et al* (1994) revealed that 35% of physicians responded that they could not care for the patients with HIV infection. 40% of physicians chose to treat HIV carrier separately from the general patient group in order to prevent transmission. However, the study did not establish significant associations between the PMTCT providers' training and experience, knowledge, attitude and the maternal and infant ARV prophylaxis.

CHAPTER 7: CONCLUSIONS AND RECOMMENDATIONS

7.1 CONCLUSIONS

The majority of the HIV positive pregnant women came from rural health facilities as opposed to urban health facilities.

Urban health facilities were more likely to be rated as having a satisfactory maternal ARV prophylaxis as compared to the rural health facilities. Provincial and district hospitals were rated higher with regard to satisfactory maternal ARV prophylaxis as compared to the sub-district, health centers and dispensary health facilities while mission health facilities had the lowest rating with regard to maternal ARV prophylaxis uptake. In fact Mission health centers were 5 times more likely to be rated as having unsatisfactory maternal ARV prophylaxis as compared to the sub-district hospitals.

HIV positive pregnant women who attended health facilities that were rated as having satisfactory infant ARV prophylaxis uptake were more likely to be older than those who attended health facilities rated as having unsatisfactory infant ARV prophylaxis. HIV positive pregnant women aged 18-24 years were more likely to come from health facilities rated as having satisfactory infant ARV prophylaxis as compared to those aged 18 years.

Majority of the HIV positive pregnant women felt that the PMTCT counseling services they received were either very good or good. Similarly, most of the HIV positive pregnant women felt they received all the necessary information they needed to know and also most of the HIV positive pregnant women felt they were warmly welcomed. This was reflected by the fact that almost all HIV positive pregnant women said they would go back to the same health facility for their care. The majority of the HIV positive pregnant women were seen within 1 hour.

Risk reduction was more likely to be discussed in health facilities rated as having satisfactory maternal ARV prophylaxis as compared to health facilities rated as having unsatisfactory maternal ARV prophylaxis uptake. HIV disclosure to partners was less likely to be discussed in health facilities rated as having unsatisfactory maternal ARV prophylaxis as compared to health facilities rated as having satisfactory maternal ARV prophylaxis uptake. Most of the HIV positive pregnant women felt they had visual and auditory privacy during the counseling sessions. Majority of the HIV positive pregnant women knew that HIV can be transmitted from HIV positive pregnant woman to the child. There was generally high quality of PMTCT services with 86.7% of the health facilities sampled having satisfactory quality of PMTCT services.

Most of the HIV pregnant women knew that antiretroviral drugs can be used for prevention of mother to child transmission of HIV. Amongst the HIV positive pregnant women who knew that HIV can be transmitted from HIV positive pregnant woman to the child 71% said that ARV's are provided to the mother before delivery. Amongst respondents who said HIV can be transmitted from HIV infected pregnant woman to the child most of them said that the transmission can occur during pregnancy. Amongst the respondents who said HIV can be transmitted from HIV positive pregnant woman to the child, majority said that ARV's are provided to the baby within 72hrs after delivery.

Most of the health facilities had satisfactory maternal and infant ARV prophylaxis uptake of over 80% as per the NASCOP targets. Majority of the PMTCT counselors interviewed were PMTCT trained and were providing PMTCT services. Most of the PMTCT counselors interviewed had a satisfactory PMTCT knowledge. However, the PMTCT counselors' knowledge and attitude had no significant association with uptake of either maternal or infant ARV prophylaxis.

Almost half of the PMTCT counselors interviewed had a positive attitude. Majority of the HIV positive pregnant women knew that HIV can be transmitted from HIV positive pregnant woman to the child.

In conclusion, there is an association between uptake of ARV prophylaxis amongst HIV positive pregnant women and institutional factors such as risk reduction, HIV disclosure in the greater Kakamega district.

12 RECOMMENDATIONS

1. DMOH's should ensure regular supervision of the health care providers providing PMTCT services to ensure compliance with the national PMTCT guidelines in service delivery. This should also offer opportunity for them to give relevant feedback. More emphasis needs to be given to newer districts, lower level health facilities and mission hospitals.
2. DMOH's should strengthen supervision and mentorship on level 2 and 3 health facilities as well as newly created districts to promote PMTCT services including use of ARV prophylaxis.
3. DASCO's should promote use of maternal and infant ARV prophylaxis in mission health facilities.
4. Due to the unsatisfactory infant ARV prophylaxis uptake amongst youths in Kakamega district, the provincial Reproductive Health coordinator and youth officers should intensify PMTCT awareness including use of infant ARV prophylaxis through youth in school and youth out of school programmes.
5. Trainings/refresher trainings in PMTCT, stigma reduction, positive attitude towards PMTCT and regular mentorship should be considered for PMTCT providers. Emphasis on quality of PMTCT counseling (pre- and post-test counseling) including issues on risk reduction, HIV disclosures to partners and condom use and demonstration should be emphasized during the PMTCT training and mentorship.
6. Design and implement programs that inculcates positive attitude towards HIV/AIDS in general and PMTCT in particular amongst health care providers such as active involvement of PLWHAs in HIV/PMTCT program design and implementation.
7. The administration of maternal and infant ARV prophylactic regimens should be done at the same time, same day to avoid scenarios where infant ARV prophylaxis uptake is lower than the maternal ARV prophylaxis uptake.

REFERENCES

1. Agnes Soucat, Rudolf Knippenberg. (November 1999): Technical Update No. 1 Prevention of Mother to Child Transmission of HIV.
2. AMREF. (May 2006): "Behavior Change Communication strategy for the Prevention of mother to Child transmission". Amina. (2008): Best Practices in delivery of PMTCT services, 2008 HFV/AIDS Implemented meeting.
3. Amy Norman, Mickey Chopra and Suneetha Kadiyala. (2005): HIV Disclosure in South Africa: Enabling the Gateway to Effective Response.
4. Assessment of the Policy Environment for VCT, PMTCT, Treatment and Care and Support Programs in West and Central Africa report. AWARE HIV/AIDS PROJECT.2003-2008.
5. Ayisi Robert. (2007): Kenya National PMTCT data.
6. Barbara Tembo. (2006): Wrap up of Implementation Experience and report from support supervision.
7. Bryson Y. J. (1996). International Conference on AIDS N°11, Vancouver Canada. Volume 10, SUP3 (135 p.) (69 ref.), pp. S33-S42.
8. Chinh T. Le, Thanh Tung Vu, Minh Chau Luu, Thi Nhan Do, Thu-Ha Dinh and Mary L. Kamb. (2008): Preventing Mother-to-Child Transmission of HIV in Vietnam: An Assessment of Progress and Future Directions. *Journal of Tropical Pediatrics Advance*. *Journal of Tropical Pediatrics* 54(4):225-232.
9. Cooper Ellen R., Charurat Manhattan, Mofenson Lynne, Hanson I. Celine, Pitt Jane, Diaz Clemente, Hayani Karen, Handelsman Edward, Smeriglio Vincent, Hoff Rodney, Blattner William. (2002): Combination antiretroviral strategies for the treatment of pregnant HIV-1-infected women and prevention of perinatal HIV-1 transmission. *Journal of Acquired Immune Deficiency Syndromes*, 29(5):484-494.
10. Creek TL, Ntummy R, Mazhani L, Moore J, Smith M, Shaffer N, Kilmarx PH.(2003): Knowledge, attitudes, and practices among midwives and counselors regarding prevention of mother to child transmission of HIV (PMTCT) - Botswana: International Conference on AIDS 2004 Jul 11-16.
11. Damien De Walque. (June 1, 2006): Discordant couples: HIV infection among couples in Burkina Faso, Cameroon, Ghana, Kenya, and Tanzania.
12. Dabis F, Msellati P, Meda N, Welffens-Ekra C, You B, Manigart O, Leroy V, Simonon A, Cartoux M, Combe P, Ouangre A, Ramon R. Ky-Zerbo O, Montcho C, Salamon R, Rouzioux C, Van de Perre P, Mandelbrot L.(1999): Six month efficacy, tolerance and acceptability of a short regimen of oral zidovudine to reduce vertical transmission of HIV in breastfed children in cote d'Ivoire and Burkina Faso: a double-blind placebo-controlled

- multicenter trial. *The Lancet*, Volume 353, Issue 9155, Pages 786 - 792.
13. Delvaux Therese, Jelul Batya, Ndagije Felix, Munyana Eleanie, Roberfroid Dominique, Asiimwe Anita. (2009): Determinants of Nonadherence to a Single-Dose Nevirapine Regimen for the Prevention of Mother-to-Child HIV Transmission in Rwanda. *Journal of Acquired Immune Deficiency Syndromes*: Volume 50 - Issue 2 - pp 223-230.
 14. Eduardo Villamor, Lara Misegades, Maulidi Fataki, Roger Mbise and Wafaie Fawzi. (2005): Child mortality in relation to HIV infection, nutritional status, and socio-economic background.
 15. Evaluation of Access to and Utilization of Services for the Prevention of Mother-to-Child Transmission (PMTCT) of HIV in Rwanda. (January 2007). Pages 11-15.
 16. Evaluation report. (2003). Global: Evaluation of United Nations-supported pilot projects for the prevention of mother-to-child transmission of HIV.
 17. Family Health International. (2006): An Assessment of Services for Adolescents in Prevention of Mother-to-Child Transmission Programs. Family Health International Working Paper Series No. WP06-01 Family Planning and AIDS Prevention. (1997): Network, vol. 17(2).
 18. Fowler, Mary Glenn, Lampe, Margaret A., Jamieson, Denise, Kourtis, Athena P., Rogers, Martha F. (September 2007): Reducing the risk of mother-to-child human immunodeficiency virus transmission: past successes, current progress and challenges, and future directions. *American Journal of Obstetrics and Gynecology*. 197 (3 Suppl 1):S3-S9.
 19. Farquhar C, Kiarie JN, Richardson BA, Kabura MN, John FN, Nduati RW, Mbori-Ngacha DA, and John-Stewart GC. (2004): Antenatal Couple Counseling Increases Uptake of Interventions to Prevent HIV-1 Transmission. *Journal of Acquired Immune Deficiency Syndromes* 37:1620-1626.
 20. Fifth IAS Conference on HIV Pathogenesis, Treatment and Prevention 19th-22nd July 2009.
 21. Felice M. Apter (2003). Elizabeth Glaser Pediatric AIDS Foundation. FHI/USAID. (June 2006): "Strategic Framework for Preventing Mother to Child Transmission of HIV".
 22. Green J. (1995): Cultural awareness in the human services: A multi-ethnic approach. 2nd Edition. Toronto.
 23. Guay A, Musoke P, Fleming T, Bagenda D, Alien M, Nakabiito C, Sherman J, Bakaki P, Ducar C, Deseyve M, Ernel L, Mirochnick M, Fowler G, Mofenson L, Miotti P, Dransfield K, Bray D, Mmro F, Jackson JB. (1999). Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomized trial. *Lancet* 354(9181):795-802.
 24. Gondi P, Fullilove B, Balamba P, Vegunta M, Yelamanchali H, Raghavan S; International Conference on AIDS. (2002): Clinician perspective towards the provision of prevention of

- mother to child transmission (PMTCT) services in Southern India. International conference on AIDS. 2002 Jul 7-12; 14: abstract no. ThPeC7431.
25. Homsy J, Kalanya JN, Obonyo J, Ojwang J, Mugumya R, Opio C, Mermin J .(2006): Routine intrapartum HIV counseling and testing for prevention of mother-to-child transmission of HIV in a rural Ugandan hospital. *Journal of Acquired Immune Deficiency Syndrome* 42:149-154.
 26. Homsy J, King R, Malamba S, Opio C, Kalamya J, mermin J, Okallanyi A, Obonyo J. (2007). The need for partner consent is a main reason for opting out of routine HIV testing for prevention of mother-to-child transmission in a rural Ugandan hospital *Journal of Acquired Immune Deficiency Syndromes* 44:366-369.
 27. Horvath T, Madi BC, Iuppa IM, Kennedy GE, Rutherford G, Read JS. (2009): Interventions for preventing late postnatal mother-to-child transmission of HIV. *Cochrane Database of Systematic Reviews* 2009, Issue 1. Art. No.: CD006734. DOI: 10.1002/14651858.CD006734.pub2.
 28. Inoue E, Sano M, Tadano J, Miyazaki S, Shimamoto Y, Ohta Y, Harada Y, Edakuni Y.(1994): Public and health care worker knowledge and attitudes toward HIV infection in Saga. *International Conference on AIDS. International Conference on AIDS. 1994 Aug 7-12; 10: 370 (abstract no. PD0088).*
 29. Jackson JB, Musoke P, Fleming T, Guay LA, Bagenda D, Allen M, Nakabiito C, Sherman J, Bakaki P, Owor M, Ducar C, Deseyve M, Mwatha A, Emel L, Duefield C, Mirochnick M, Fowler MG, Mofenson L, Miotti P, Gigliotti M, Bray D, Mmizo F.(2003):Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala,Uganda: 18-month follow-up of the HIVNET 012 randomized trial. *Lancet* 362 (9387): 859-868. Available at <http://www3.niaid.nih.gov/news/newsreleases/2003/hivnet.htm>.
 30. John-Stewart G, Mbori-Ngacha D, Ekpini R, Janoff EN, Nkengasong J, Read J. (2004): Breast-feeding and transmission of HIV-1. *Journal of Acquired Immune Deficiency Syndrome*; 35:196-202.
 31. Karita E, Uwamaliya H, Carmelinda S, Munyangabe C, Mpfizi B, Tekirya E, Rusanganwa E, Shengero S, Van Hove D.(2002): Acceptability and feasibility of the introduction of a short regimen of oral zidovudine (ZDV) to reduce mother to child transmission (MTCT) of HIV in Rwanda. *International Conference on AIDS. Jul 9-14; 13: abstract no. WeOrC551.*
 32. Karl Peltzer, Donald Skinner, Sakhumzi Mfecane, Olive Shisana, Ayanda Nqeketo, Thabang Mosala. (2005): Factors influencing the utilization of prevention of mother-to-child transmission (PMTCT) services by pregnant women in the Eastern Cape, South Africa. *Health SA Gesondheid* Vol. 10 No. 1.

33. Kenya National Curriculum and implementation guide for health care providers. (March 2007): Comprehensive Pediatric HIV Care.
34. Kenya HIV/AIDS Data Booklet NACC. (2005).
35. Kenya National PMTCT Guideline. (June 2005).
36. Kenya National PMTCT Training Curriculum. (2005).
37. Kenya National AIDS Strategic Plan II.
38. Kenya National Curriculum and Implementation Guide for health care providers. (2007).
39. Kenya AIDS Indicator Survey. (2007).
40. Kenya Demographic Health Survey. (2003).
41. Kenya Ministry of Health. 1st Edition (October 2005): Facilitative Supervision Manual for Supervisors of Reproductive Health services.
42. Kevin M. De Cock, Mary Glenn Fowler, Eric Mercier, Isabelle de Vincenzi, Joseph Saba, Elizabeth Hoff, David J. Alnwick, Martha Rogers, Nathan Shaffer.(2000): Prevention of Mother-to-Child HIV Transmission in Resource-Poor Countries. Vol. 283 No. 9. The Journal of the American Medical Association; 283:1175-1182.
43. Konde-Lule JK, Serwadda D, Musgrave S, Wawer MJ, Musagara M, Sewankambo N.(1990). The effect of HIV infection on infant and early childhood mortality in rural Rakai District, Uganda. International Conference on AIDS. Jun 20-23; 6: 312.
44. Kindyomunda Rosemary Mwesigwa. (August 7 2003): Report of the Regional PMTCT meeting, Uganda AIDS Commission.
45. Laurent Mandelbrot, Aline Landreau-Mascaro, Claire Rekecewicz, Alain Berrebi, Jean Louis Benifla, Marianne Burgard, Eric Lachassine, Beatrice Barret, Marie-Laure Chaix, Andre Bongain, Nicole Ciraru-Vigneron, Catherine Crenn-Hebert, Jean-Francois Delfraissy, Christine Rouzioux, Marie-Jeanne Mayaux, Stephane Blanche. (2001). Lamivudine-zidovudine combination for prevention of maternal-infant transmission of HIV-1. Journal of the American Medical Association, 285(16):2083-2093.
46. Leroy Valeriane, Sakarovitch Charlotte, Cortina-Borja Mario, McIntyre James, Coovadia Hoosen, Dabis Francois, Newell Marie-Louise. (2005): Is there a difference in the efficacy of peripartum antiretroviral regimens in reducing mother-to-child transmission of HIV in Africa? Journal of Acquired Immune Deficiency Syndrome: 19(16): 1865-1875.
47. Leroy V, Karon M, Alioum A, Ekpini R, van de Perre P, Greenberg E. (2002): Twenty-four month efficacy of a maternal short-course zidovudine regimen to prevent mother to child transmission of HIV-1 in West Africa. Journal of Acquired Immune Deficiency Syndrome; 16:631-641.
48. Luo C, Akwara P, Ngongo N, Doughty P, Gass A.(2007): Global Progress in prevention of mother-to child transmission of HIV and pediatric HIV care and treatment in low- and

- middle-income countries Scaling up Progress from 2004 to 2005. *Reproductive Health Matters*; 15(30): 179-189.
49. Lynne Mofenson, John Lambert, Richard Stiehme, James Bethel, William Meyer, Jean Whitehouse, John Moye, Patricia Reichelderfer, Robert Harris, Mary Fowler, Bonnie Mathieson, George Nemo. (1999): Efficacy of zidovudine and hyperimmune HIV immunoglobulin for reducing perinatal HIV transmission from HIV infected women with advanced disease: results of Pediatric AIDS Clinical Trials Group Protocol. *Canadian Journal of Infectious Diseases* Vol. 179:567-575.
 50. Lily Kak, Inam Chitsike, Chewe Luo, Nigel Rollins (2004): Prevention of mother-to-child transmission of HIV/AIDS programmes.
 51. Likert, Rensis. (1932): "A Technique for the Measurement of Attitudes". *Archives of Psychology* 140: 1-55.
 52. Mark Cichocki. (2009): About.com Guide to AIDS/HIV.
 53. Marie-Louise Newell, Mario Cortina-Borja, Claire Thorne, and Catherine Peckham. (January 2003). *Pediatrics* Vol. 111 No. 1, pp. e52-e60. Available at: <http://pediatrics.aappublications.org/cgi/content/full/111/1/e52>.
 54. Marie-Louise Newell. (2006): Current issues in the prevention of mother-to-child transmission of HIV-1 infection. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 100, 1—5.
 55. Mandelbrot, Laurent; Le Chenadec, Jerome; Berrebi, Alain; Bongain, Andre; Benifla, Jean-Louis; Delfraissy, Jean-Francois; Blanche, Stephane; Mayaux, Marie-Jeanne. (1999): Perinatal HIV-1 Transmission: Interaction Between Zidovudine Prophylaxis and Mode of Delivery in the French Perinatal Cohort. *Obstetrical and Gynecological Survey*. Volume 54 - Issue 1 - pp 15-16.
 56. Malonza IM, Richardson BA, Kreiss JK, Bwayo J, John-Stewart GC. (2003): The effect of rapid HIV-1 testing on uptake of prenatal HIV-1 interventions; a randomised clinical trial. *AIDS* 17:113-118. Mandelbrot L, Mayaux MJ, Bongain A. (1996): Obstetric factors and mother-to-child transmission of human immunodeficiency virus type 1: the French perinatal cohorts. *American Journal Obstetric Gynecology*, 175:661-667.
 57. Moth I A, Ayayo A B C O, Kaseje D O. (2005): Assessment of utilization of PMTCT services at Nyanza Provincial Hospital, Kenya. *Journal of Social Aspects of HIV/AIDS* Volume 2 number 2.
 58. Ministry of Health. *Essential Obstetric Care Manual*. Third Edition. (January 2006): For Health Service Providers in Kenya.
 59. Mickey Chopra, Debra Jackson, Ann Ashworth and Tanya Doherty. (2004): An Evaluation of the Quality of Counseling Provided to Mothers in Three PMTCT Pilot Sites in South

Africa Ministry of Health.

60. Michael C. Thigpen (March 3, 2006): DTM&H, Division of HIV/AIDS Prevention, and National Center for HIV, STD, and TB Prevention.
61. Ministry of health. Kakamega district, annual health plan, FY - 2007/2008 pages 10-12.
62. Ministry of Health. 2nd Edition. (2002): National AIDS and STD Control program. National guidelines for the prevention of mother-to-child HIV.
63. Ministry of Health. 3rd Edition. (2009): Guidelines for Prevention of Mother to Child Transmission of HIV/AIDS in Kenya.
64. Medley A, Garcia-Moreno C, McGill S, Maman S.(July 2004): Rates, barriers and outcomes of HIV serostatus disclosure among women in developing countries: implications for prevention of mother-to-child transmission programmes. *Journal of Bull World Health Organization*; 2004 Jul; 82(7):552.
65. Msuya G, Msaky H, Reeler A, Kironde S, Nzima M, Munisi W, Manumbu C, Ntyangiri E, Wilfert C; International Conference on AIDS (15th : 2004 : Bangkok, Thailand). (2004): Motivating staff for PMTCT through comprehensive training: The Tanzania experience. *International Conference on AIDS*. 2004 Jul 11-16; 15: abstract no. B12629.
66. National AIDS Control Council. (2005). Namwinga C., Rahama K., Amina M., Meg D., Rene E. (June 5 2008): Best Practices in delivery of PMTCT services, 2008 HIV/AIDS Implemented 'meeting.
67. Newell, Marie-Louise. (1998): Mechanisms and timing of mother-to-child transmission of HIV-1. *Journal of Acquired Immune Deficiency Syndrome*. 12(8):831-837.
68. Newton I. Kumwenda, Donald R. Hoover, Lynne M. Mofenson, Michael C. Thigpen, George Kafulafula, Qing Li, Linda Mipando, Kondwani Nkanaunena, Tsedal Mebrahtu, Marc Bulterys, Mary Glenn Fowler, and Taha E. Taha.(2008) :Extended Antiretroviral Prophylaxis to Reduce Breast-Milk HIV-1 Transmission. *The New England Journal of Medicine*. Volume 359:119-129.July 10, 2008.Number 2.
69. Nduati R, John G, Mbori-Ngacha D, Richardson B, Overbaugh J, Mwatha A, Ndinya-Achola J, Bwayo J, Onyango FE, Hughes J, Kreiss J. (2000): Effect of breastfeeding and formula feeding on transmission of HIV-1: a randomized clinical trial. *Journal of the American Medical Association*; 283:1167-74.
70. Nduati Ruth. (2002).¹"Programmatic issues around PMTCT".
71. Nduati RW, Mbori-Ngacha DA, Kalibala S, Rutenberg N, Muthami L, Mwai C, Oyieke J; International Conference on AIDS.(2002): Infant and maternal nutrition education/counseling and HIV risk reduction counseling at two integrated PMTCT sites in rural Kenya. *International Conference on AIDS*. 2002 Jul 7-12; 14: abstract no. ThPeD7770.
72. Nduati R, Richardson B, John G, Mbori-Ngacha D, Mwatha A, Ndinya-Achola J, Bwayo J,

- Onvango FE and Kreiss J. (2001): Effect of breastfeeding on mortality among HIV-1 infected women: a randomised trial. *Lancet*. 2001 May 26; 357: 1651-5.
73. Nduati R, John G, Mbori-Ngacha D, Richardson B, Overbaugh J, Mwatha A, Ndinya-Achola J, Bwayo J, Onyango FE, Hughes J, Kreiss J. (2000): Effect of breastfeeding and formula feeding on transmission of HIV-1; a randomized clinical trial. *Journal of Acquired Immune Deficiency Syndromes*. 2000 Mar 1; 283: 1167-74.
74. Nielsen K, Boyer P, Dillon M, Wafer D, Wei LS, Garratty E, Dickover RE, Bryson YJ (1996): Presence of human immunodeficiency virus (HIV) type 1 and HIV-1-specific antibodies in cervicovaginal secretions of infected mothers and in the gastric aspirates of their infants. *Journal of Infectious Disease*, 173:1001-1004.
75. Nyankesha Eleanie. (2008): Scaling-up National PMTCT program. Phasing more efficacious ARV regimen for PMTCT in resource limited setting. Lessons learned from Rwanda .XVII International AIDS Conference Mexico City, 3-8 August 2008.
76. Nuwagaba-Biribonwoha H, Mayon-White RT, Okong P, Carpenter LM .(2007): Challenges faced by health workers in implementing the prevention of mother-to-child HIV transmission (PMTCT) programme in Uganda. *Journal of Public Health* 29(3):269-2743.
77. Olive Jean Dunn. Second Edition. (2004). *Basic Statistics: A primer for the Biomedical Sciences*.
78. Onyango S, Magoni M. (2002): Implementing PMTCT program in Uganda: Challenges and lessons learned. *International Conference on AIDS*. July 7-12; 14: abstract no. TuPeF5404.
79. Peltzer, K., Skinner, D., Mfecane, S., Shisana, O., Nqeketo, A. & Mosala, T. (2005): Factors influencing the utilization of prevention of mother-to-child-transmission (PMTCT) services by pregnant women in the Eastern Cape, South Africa. *Health SA Gesondheid*. 10(1):26-40.
80. Peter E. Fishkin, F. Daniel Armstrong, Donald K. Routh, Lynnette Harris, Winsome Thompson, Katya Miloslavich, Jacqueline D. Levy, Arnise Johnson, Connie Morrow, Emmalee S. Bandstra, Craig A. Mason and Gwendolyn Scott. (March 2006): Relationship between HIV Infection and WPPSI-R Performance in Preschool-Age Children. *Pediatrics* Vol. 117 No. 3, pp. 851-862.
81. Perez F, Zvandaziva C, Englesmann B, Dabis F. (2006): Acceptability of routine HIV testing (opt-out) in antenatal services in two rural districts of Zimbabwe. *Journal of Acquired Immune Deficiency Syndromes* 41:514-520.
82. Pornsinee Amornwichee, Achara Teeraratkul, R. J. Simonds, Thananda Naiwatanakul, Nartlada Chantharojwong, Mary Culnane, Jordan W. Tappero, Siripon anshana. (2002): Preventing Mother-to-Child HIV Transmission, The First Year of Thailand's National Program .*Journal of the American Medical Association* vol.288 No.2, July 10.

85. Philip JR Goulder, Prakash Jeena, Gareth Tudor-Williams and Sandra Burchett (February 8, 2006): Pediatric HIV infection: correlates of protective immunity and global perspectives in prevention and management.
84. Preventing Mother-to-Child Transmission of HIV in Kenya Pathfinder International's Experience: 2002-2005, page 4.
85. Regional Ministerial Review Conference on Implementation of the Dakar/Ngor Declaration and the Programme of Action of the International Conference on population and Development, Dakar: Senegal (7-11 June 2004).
86. Revised Recommendations for HIV testing of Adults, Adolescents and pregnant Women in Health-Care Settings. (2006).
87. Renee Smith, Kathleen Malee, Robert Leighty, Pim Brouwers, Claude Mellins, Joan Hittelman, Cynthia Chase, Ileana Blasini. (March 2006): Effects of Perinatal HIV Infection and Associated Risk Factors on Cognitive Development among Young Children. *Pediatrics* 117(3): 851-862.
88. Ruslan Malyuta, Marie-Louise Newell, Mikael Ostergren. Claire Thorne and Nadezhda Zhilka. (2006): Prevention of mother-to-child transmission of HIV infection: Ukraine experience to date. *The European Journal of Public Health* Volume 16 (2): 123-127.
89. Samson Kironde, Alexander Mugume, Lydia E Buzaalirwa, Joshua Kakaire. (2007): Uphold Working Paper: Prevention of Mother to Child Transmission of HIV.
90. Shaffer N, Chuachoowong R, Mock PA, Bhadrakom C, Siriwasin W, Young NL, Chotpitayasunondh T, Chearskul S, Roongpisuthipong A, Chinayon P, Karon J, Mastro TD, Simonds RJ.(1999): short course zidovudine for perinatal HIV-1 transmission in Bangkok, Thailand: a randomized controlled trial. *Lancet* vol.353:773-778.
91. Sheldon H. Landesman., Leslie A. Kalish, David N. Burns, Howard Minkoff, Harold E. Fox, Carmen Zorrilla, Pat Garcia, Mary Glenn Fowler, Lynne Mofenson, Ruth Tuomala.(1996): The Women and Infants Transmission Study. *The New England journal of Medicine*. Volume 334:1617-1623.Number 25.
92. Sheldon H. Landesman, Leslie A. Kalish, David N. Burns, Howard Minkoff, Harold E. Fox, Carmen Zorrilla, Pat Garcia, Mary Glenn Fowler., Lynne Mofenson., Ruth Tuomala. (1996). Obstetrical factors and the transmission of human immunodeficiency virus type 1 from mother to child. *New England Journal of Medicine* 334.
93. Taha Taha E., Hoover Donald R., Dallabetta Gina A., Kumwenda Newton I., Mtimavalye Laban A. R., Yang Li-Ping, Liomba George N., Broadhead Robin L., Chipangwi John D., Miotti Paolo G.(1998). Bacterial vaginosis and disturbances of vaginal flora: association with increased acquisition of HIV. *Journal of the International AIDS Society*. Volume 12 - Issue 13-p 1699-1706.

94. Taha TE, Kumwenda NI, Gibbons A, Broadhead RL, Fiscus S, Lema V, Liomba G, Nkhoma C, Miotti PG, Hoover DR. (2003): Short exposure prophylaxis in newborn babies to reduce mother to child transmission of HIV-1: NVAZ randomized clinical trial. *The Lancet*, Volume 362, Issue 9391, Pages 1171 - 1177.
95. Thu Anh Nguyen, Pauline Oosterhoff, Yen Pham Ngoc, Pamela Wright, and Anita Hardon. (2008): Barriers to access prevention of mother-to-child transmission for HIV positive women in a well-resourced setting in Vietnam. *AIDS Research and Therapy*. 5: 7.
96. Thu Anh Nguyen. (2004) Voluntary Counseling and Testing on HIV/AIDS for Pregnant Women at Antenatal Clinics: Obstacles and Challenge The President's Emergency Plan for AIDS Relief: Second Annual Report to Congress.
97. UNAIDS. (2002): Pediatric HIV infection and AIDS.
98. UNAIDS Global Report. (2006).
99. UNAIDS. (2007): AIDS Epidemic Update.
100. UNAIDS. (2009): AIDS Epidemic Update.
101. USAID Kenya report. (2008).
102. USAID. (15 March 2001). Efforts to Prevent Mother -to-child transmission of HIV/AIDS. Report to congress pages 20-60.
103. Wiktor SZ, Ekpini E, Karon JM, Nkengasong J, Maurice C, Severin ST, Roels TH, Kouassi MK, Lackritz EM, Coulibaly IM, Greenberg AE. (1999): short course oral zidovudine for prevention of mother to child transmission of HIV-1 in Abidjan, Cote d'Ivoire: a randomized trial. *Lancet* 1999; 353:781-785. Wikipedia, the free encyclopedia. Available at: <http://en.wikipedia.org/wiki/Pregnancy>. Accessed on 18th April 2008.
104. Winfred Mutsotso. (December 2005): Kenya National Program: Experiences, Challenges, lessons emerging.
105. Winfreda Chandisarewa, Lynda Stranix-Chibanda Elizabeth Chirapa Anna Miller Micah Simoyi Agnes Mahomva Yvonne. Maldonado Avinash K Shetty. (2007): Routine offer of antenatal HIV testing ("opt-out" approach) to prevent mother-to-child transmission of HIV in urban Zimbabwe. *Bulletin World Health Organization* vol.85 no.1 1.
106. Wilfert CM, Fowler MG (2007): Balancing maternal and infant benefits and the consequences of breast-feeding in the developing world during the era of HIV infection. *Journal of Infectious Disease*; 195:165-167. WHO/UNICEF/UNAIDS HIV and infant feeding Guidelines for decision-makers, 2003.
107. WHO meeting report, 2004.

APPENDIX 1: SCHEDULE OF ACTIVITIES AND BUDGET

ACTIVITY	PERSON(S) RESPONSIBLE	VENUE	MONTHS(2 008)					MONTHS(2009)												2010		BUDGET (US \$)			
			A	S	C	N	E	J	F	M	A	M	J	J	A	S	O	N	D	J					
proposal development	Principal Investigator, Supervisors	Kakamega																							140.00
review of proposal by ethical committee	Ethical Committee	Nairobi																							100.00
training of enumerators	Principal Investigator	Kakamega																							300.00
purchase of materials	Principal Investigator, Supervisors	Kakamega																							800.00
-testing data collection instruments	Principal Investigator, Research assistants, Enumerators	Kakamega																							150.00
data collection	Principal Investigator, Research assistants, Enumerators	Kakamega																							3000.00
interviews	Supervisors	Kakamega																							0.00
data entry	Principal Investigator, Statistician	Nairobi																							300.00
printing of questionnaires	Principal Investigator	Kakamega																							200.00
transportation	Principal Investigator	Department of Community Health, University of Nairobi																							40.00
																									1200.00
contingency																									623.00
RAND TOTAL																									6853.00

The figures in the budget are reported in US\$ with an approximate conversion rate of 80 Kenya shillings=1US\$.

Statement regarding potential conflict of financial interest:

The principal investigator has no financial interest in any component of this study.

APPENDIX II: RESEARCH PARTICIPANT FORM

CONSENT TO PARTICIPATE IN THE RESEARCH STUDY:

ASSESSMENT OF INSTITUTIONAL FACTORS AFFECTING UPTAKE OF ARV PROPHYLAXIS AMONGST HIV POSITIVE PREGNANT WOMEN IN KAKAMEGA DISTRICT

PRINCIPAL INVESTIGATOR

Maxwell Philip Omondi,
College of Health Sciences,
Department of Community Health. Nairobi University,
PO BOX 18717 00100,
NAIROBI.

Email: maxwellomondi@yahoo.com

Tel: 0721 208 732

Hello,

I, *Maxwell Philip Omondi*, am a postgraduate student in the Department of Community Health in Nairobi University. I am conducting a study for the purpose of assessing the institutional factors affecting the uptake of ARV prophylaxis amongst HIV positive pregnant women in Kakamega district.

POSSIBLE BENEFITS

No direct benefits for participating in the study. However, study will help identify some of the factors that influence the uptake of ARV prophylaxis and hence improve uptake of ARV prophylaxis amongst HIV positive pregnant women in Kakamega district and other PMTCT programs in the country.

The HIV exposed babies and their mothers will be enrolled in HIV care and treatment and will be accorded the appropriate patient management as per the ministry of health/NASCOP guidelines.

CONFIDENTIALITY

All information obtained in this study will be considered confidential and not divulged to anyone not involved in the study. The participants' identification will be kept confidential. The questionnaires and discussion notes will be marked only with codes and not names. The list of

numbers will be destroyed at the end of the research. The research reports and publications will only discuss large groups of participants and will not reveal individual names. Every effort will be made to protect the confidentiality of the information provided. The questionnaires will be kept under lock and key with restricted access.

COMPENSATION

We will not be able to provide you any payment or gift for being in this research.

RIGHT TO REFUSE OR WITHDRAW

A subject' participation in the study is entirely voluntary. He /she is free to refuse to take part or withdraw at any time, without affecting or jeopardizing her future medical care or career.

QUESTIONS

In case of any queries, comments or complaints, kindly contact the investigator in above mentioned address.

CONSENT

I have read/been explained to all the above and fully understand. I therefore agree/disagree to participate in the study.

Investigator

Signature

Date

Participant

Signature

Date

APPENDIX III: QUALITY OF PMTCT COUNSELLING AND LEVEL OF AWARENESS ON ARV PROPHYLAXIS-CLIENT EXIT INTERVIEW.

Introduction

We are conducting a survey with users of our health facility to find out what you think about our services. This will help us improve quality to future clients. Your answers are strictly confidential and we thank you for your participation and honesty.

Discussant: HIV positive pregnant woman

Name of the interviewer

Participant's serial number

District

"Name of the facility

Location (01-urban, 02-rural)

Type of Hospital (01-Provincial Hospital,02-District Hospital,03-Sub-District Hospital,04-Health center, 05-Dispensary,06-Mission Hospital)

Type of sector (01-Government, 02-Non-Governmental)

Background information of the discussant

Age.....DOB

Marital status (1-Single, 2-Married, 3-Separated, 4-Widowed 5-Divorce)

Sex (1-Male, 2-Female)

Level of Education (0-None, 1-Nursery, 2-Primary, 3-Secondary, 4-Tertiary)

Current Residence

Length of stay in the current Residence

Religion (01-Christianity 02-Islam)

QUALITY OF PMTCT COUNSELLING

1. How long did you wait to see the counsellor?

[] <30mins [] 30mins—1 hr [] 1-2hrs [] >2hrs

2. How did the counsellor welcome you?

[] Warm [] Neutral [] Cold

3. Did the counsellor explain to you what to expect in the session?

[] Yes [] No [] Not sure

4. Did the counsellor help you to feel free to talk about all your concerns and personal issues?

Yes No Not sure

5. Did you feel the counsellor listened to you?

Yes No Not sure

6. Did you feel the counsellor understood your concerns and personal issues?

Yes No Not sure

7. Did you feel your personal issues would remain safe between you and the counsellor?

Yes No Not sure

Did the counsellor discuss the following issues with you:

8. Risk behaviour? Yes No Not sure

9. Disclosure to partner? Yes No

10. Condom use? Yes No

11. Was the counsellor comfortable discussing these issues with you?

Yes No Not sure

12. Was condom use demonstrated?

Yes No

13. Did you have a blood sample taken today?

Yes No

14. How many times did the counsellor prick your finger to take the sample?

once twice 3 times >3 times

15. Did you feel comfortable when your sample was taken?

Yes No

16. Did you feel the counsellor was confident in his/her job?

Yes No Not sure

17. Was the counsellor respectful towards you?

Yes No

18. Was the counsellor genuine towards you?

Yes No Not sure

19. How many times have you previously tried to get PMTCT services and been unsuccessful?

None once twice 3times >3times

20. Did you have visual privacy during the counselling session?

Yes No

21. Did you have auditory privacy during the counselling session?

Yes No

22. Did you have enough time with the counsellor?

Too long Just right Too short

23. Did you feel that that you received all the necessary information you needed to know?
 Yes No Not sure
24. Was the counselling room in a convenient place?
 Yes No
25. How was the attitude of the other staff at the health facility?
 Very good Good Fair Poor
26. Will you recommend the service to others?
 Yes No
- If no, why?

26. Would you come back to this facility for your care?

Yes No

27. Overall, what do you think about the service you received today?

Very good Good Fair Poor

28. Are there any other special comments (including recommendations) you wish to make?

II. LEVEL OF AWARENESS ON ARV PROPHYLAXIS

1. Can HIV be transmitted from HIV positive pregnant woman to the child?

A. Yes B. No

(If the answer is No, skip the remaining questions)

2. If yes, when can this happen.

A. During pregnancy Yes No Don't Know

B. During delivery Yes No Don't Know

C. During breastfeeding Yes No Don't Know

3. How can the transmission of HIV from the HIV positive pregnant woman to the child be prevented?

A. Use of ARVs Yes No Don't Know

B. Exclusive breastfeeding Yes No Don't Know

C. Formula feeding Yes No Don't Know

4. Does a pregnant woman use ARVs to prevent HIV transmission from the HIV positive pregnant woman to the child? Yes No Don't Know

If yes, when. Please, explain

5. Does the baby born of HIV positive pregnant women get ARVs?

If yes, when? Please, explain. Yes No Don't Know

Thank you very much for your patience and time!

APPENDIX IV: QUALITY OF PMTCT SERVICE, PROVIDER SUPPORT AND SUPERVISION

Discussant: This will be discussed with the PMTCT counselor/nurse

Name of the interviewer

Instructions: The research assistant will ask the questions and record the responses as either YES or No for each question.

Participant's Serial number

District

Name of the facility

Location (01 -urban, 02-rural)

Type of Hospital (01-Provincial Hospital,02-District Hospital,03-Sub-District Hospital,04-Health center,05-Dispensary,06-Mission Hospital)

Background information of the discussant

Age.....DOB

Marital status (1-Single, 2-Married, 3-Separated, 4-Widowed 5-Divorce)

Sex (1-Male, 2-Female)

Level of Education (0-None, 1-Nursery, 2-Primary, 3-Secondary, 4-Tertiary)

Current Residence

Length of stay in the current Residence

g) Religion (01 -Christianity 02-Islam)

/. QUALITY OF PMTCT SERVICE

A) THE CLIENTS RIGHTS TO SAFE SERVICES

	YES	NO
Are clients advised on the risks and benefits for HIV testing?	[1	M
Do clients receive information about the benefits and side effects associated with ARV prophylaxis?	[]	[]
Are sterile needles, lancets and syringes used?	M	f1
Are needles and other sharp objects put in use, puncture-resistant containers immediately after use?	[]	[1
Are all instruments cleaned with detergent solution and water?	n	n
Do staffs wear heavy-duty gloves to clean used instruments and to dispose of medical and hazardous chemical waste?	t]	[]
Is medical and hazardous waste disposed of by burning or burying?	r i	[]

Comments

Your RIGHT TO SAFE SERVICES SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

B) THE CLIENTS RIGHTS TO PRIVACY AND CONFIDENTIALITY

	YES	NO
Is client counseling always done with visual privacy?	[1]	[1]
Is client counseling always done with auditory privacy?	[1]	[1]
Do examination and procedure rooms have visual privacy?	[]	[1]
Do examination and procedure rooms have auditor}' privacy?	M	[1]
Do staffs avoid interrupting counseling and examination sessions?	[1]	[1]
Does staff respect patients' and clients' requests for strict confidentiality?	[]	[1]
Do staffs refrain from discussing clients with people not directly involved in the clients' care?	[]	[]
Does the site have a separate record for each client?	n	n
Is access to client records strictly controlled?	[i]	[i]
Are all tests and procedures done with full informed consent of the client?	M	M

Comments

Your RIGHT TO PRIVACY AND CONFIDENTIALITY SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

C) THE CLIENTS RIGHTS TO INFORMATION

	YES	NO
Are there signs showing where PMTCT services are located?	[]	[1]
Is there at least one PMTCT poster and one HIV/AIDS or STI poster in a local language in the waiting room?	[]	[]
Are there health videos, flip charts, drama or leaflets on PMTCT in the health facilities?	[]	[]
Are there health talks on how HIV is transmitted and not transmitted?	[]	[1]
Are there health talks on the differences between HIV and AIDS?	[]	n
Are there health talks on the risks of MTCT of HIV during pregnancy, childbirth and breastfeeding?	[]	[i]
Are there health talks on opportunities to reduce mother to child transmission through antiretroviral treatment, appropriate antenatal, delivery and postpartum care and modification of infant feeding?	[]	t]
Are there health talks on the interaction between HIV and other diseases like STIs, TB?	[]	t]
Are there health talks at least once a week in the clinic that include HIV/AIDS and STIs?	[]	t]
Are there health talks at least once a week in the clinic that include child nutrition (including breastfeeding for HIV positive pregnant women)?	[]	t]
Are there health talks at least once a week in the clinic that include how to prevent mother to child transmission of HIV?	[]	t]
Does staff from the clinic give planned/scheduled health talks in the community?	[]	[i]

Comments

[Your RIGHT TO INFORMATION SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

D) THE CLIENTS RIGHTS TO DIGNITY, COMFORT AND EXPRESSION OF OPINION

	YES	NO
Are client-waiting areas clean, well-ventilated and with enough seating space?	[]	[]
Are client toilets clean and well-ventilated?	[1]	[]
Do staffs explain examinations or procedures (HIV testing) before and during the procedure?	[]	[]
Do staffs think that client-waiting times are reasonable?	M	[]
Do staffs treat male clients or men who accompany their partners, in a friendly, respectful and supportive way, and make them comfortable?	[]	[]

Are clients' opinions regularly solicited at the facility (via formal or informal interviews, questionnaires, suggestion boxes etc)?	<input type="checkbox"/>	<input type="checkbox"/>
Are pregnant women offered HIV testing in maternity?	<input type="checkbox"/>	(I
Comments		

Your RIGHT TO DIGNITY, COMFORT AND EXPRESSION OF OPINION SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

E) THE CLIENTS RIGHTS TO CONTINUITY OF CARE

	YES	NO
Does this facility offer Maternal and Child Health, and Family Planning outpatient services (MCH/FP)	<input type="checkbox"/>	<input type="checkbox"/>
Does this facility have (or is linked with) comprehensive care clinic services?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive pregnant women who need follow-up visits told when to return?	<input type="checkbox"/>	<input type="checkbox"/>
If this facility cannot provide mother to child transmission interventions or appropriate mechanism in place (with appropriate forms) for referral to another facility?	<input type="checkbox"/>	<input type="checkbox"/>
For ANC clients, who need RTIs/STIs/HIV diagnosis and treatment, are facilities or referrals in place (with appropriate forms) to ensure they and their partners get required services?	<input type="checkbox"/>	<input type="checkbox"/>
Do staff routinely give provide PMTCT counseling services to pregnant women?	<input type="checkbox"/>	<input type="checkbox"/>
Is PMTCT services carried out here or properly referred (with appropriate form)?	<input type="checkbox"/>	<input type="checkbox"/>
Are women who are HIV positive who need HAART receive treatment or properly referred (with appropriate forms) to a higher level facility for management?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive women needing follow-up care or procedures given attention, even if they cannot pay or have no insurance?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive pregnant women (and accompanying kin) advised on recognition and management of HIV-related complications after discharge and when and where to return in the event of complications or questions?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive pregnant women return for appointments, or told when to return?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive pregnant women told how to breastfeed and obtain nutrition advise after discharge?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive pregnant women told when and how to bring the child for immunization, weighing, and other well-baby services?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive pregnant women who desire family planning told how to access family planning services?	<input type="checkbox"/>	<input type="checkbox"/>

Are STI/HIV clients who need follow up visits told when to return?	M	f	1
Are clients with suspected STIs treated at the first visit(even if they may need to wait for laboratory results)	[]	[]	
Does staff ensure that prescribed ARV drugs are available in pharmacies for the client (either to be given, or for purchase)?	[]	[]	
Does staff help HIV positive clients to contact community support groups?	[]	[]	
Does this facility provide on-going counseling and care for HIV positive clients?	[]	[]	

Comments

Your RIGHT TO CONTINUITY OF CARE SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

F) THE CLIENTS RIGHTS TO ACCESS TO SERVICES

	YES	NO
Are MCH/FP services available at least 5 days per week?	M	f
Is there a provider able to counsel ANC clients on PMTCT sendees?	N	[]
Are ARV drugs available today?	[]	[]
Do antenatal clients with complications have reliable and fast access to management of their complications?	[]	[]
Have clients the right to receive services regardless of their ability to pay or type of insurance they have?	[]	[]
Are diagnosis and treatment/or referral of RTIs/STIs/HIV available, at least five days a week?	[]	[]
Does staff use the syndromic approach for management and treatment of STIs if diagnostic tests are not available at the site, or if there are no nearby services to refer to?	[]	[]
Can men and women pick up condoms without consulting a provider(from a machine or basket)	[]	[]

Comments

Your RIGHT TO ACCESS TO SERVICES SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

G) THE CLIENTS RIGHTS TO INFORMED CHOICE

	YES	NO
Is the client always helped to determine her/his risk of HIV and STTs and are condoms actively promoted (alone or as a dual protection) for those who feel, or who appear to be, at risk?	<input type="checkbox"/>	<input type="checkbox"/>
Is a poster that outlines or discusses the right of clients displayed where clients can see it?	M	f]
Is HIV testing offered to all antenatal clients, and all risks and benefits discussed?	<input type="checkbox"/>	<input type="checkbox"/>
After PMTCT counseling, are there opt-out options and clarify any issues about their choice?	<input type="checkbox"/>	<input type="checkbox"/>
Are all clients helped to choose the type of feeding options during labor and when to administer it?	<input type="checkbox"/>	<input type="checkbox"/>
Are the risks and benefits of breastfeeding discussed with women know to be HIV positive?	<input type="checkbox"/>	<input type="checkbox"/>
Does counseling include advising clients with STIs on the importance of notifying all their partners of their status (except when to do so would endanger the client)?	<input type="checkbox"/>	<input type="checkbox"/>
Are HIV positive clients counseled about the risks of pregnancy?		

Comments

Your RIGHT TO INFORMED CHOICE SCORE	
A. Write the total of the number of times you circled YES	
B. Write the total of the number of times you circled NO	
C. Total YES and NO answers (A + B)	

% SCORE

Interpretation

The quality of care will then be determined by getting the percentage score i.e.

$$\frac{\text{YES}}{\text{YES} + \text{No}} \times 100\%$$

YES + No

For the quality of care to be satisfactory then a score of 80% will suffice.

II. PROVIDER SUPPORT AND SUPERVISION

Questions	Responses
Where do you get help if you need technical support? Please explain how often you require this and how this support helps you? <i>By technical support we mean support for yourself when you have emotionally draining counseling cases?</i>	
Where do you get administrative support and supervision?	_____
Do you have access to a designated supervisor to provide you with support and who supervises your work?	Yes _____ 1 No _____ 2
How regularly do you meet with your designated counseling supervisor?	Every day _____ 1 A few times a week _____ 2 Once a week _____ 3 Every 2 weeks _____ 4 Monthly..... 5 Irregular..... 6
Is there a formal system in place to provide supervision for providers in the PMTCT program	Yes _____ 1 No _____ 2
If yes, describe this system.	
If yes, who provides?	Support Supervision
1 Is there a counselor support group?	Yes _____ 1 No _____ 2
Are meetings between supervisors and counselors held?	Yes _____ 1 No _____ 2
If yes, how often?	Weekly _____ 1 Every other week _____ 2 Once a month _____ 3 Once every few months _____ 4 Irregular _____ 5
Are the staff responsibilities and roles clearly defined in writing and through regular meetings?	Yes _____ 1 No _____ 2
Do external supervisors meet with service and other health care staff during visits (not just with the in-charge or matron)?	Yes _____ 1 No _____ 2
Do external supervisors observe the provision of services during their regular visits?	Yes _____ 1 No _____ 2
Do internal and external supervisors follow up on issues/problems you raise/face?	Yes _____ 1 No _____ 2
Do internal and external supervisors regularly help to organize or participate in problem solving exercise at the site?	Yes _____ 1 No _____ 2
Do external or internal supervisors regularly (every six months) helped to organize training at the site?	Yes _____ 1 No _____ 2
Do external supervisors provide feedback on the service statistics you submit?	Yes _____ 1 No _____ 2
Has an external supervisor visited in the last six months?	Yes _____ 1 No _____ 2

PROVIDER SATISFACTION

Questions	Responses
ONLY STAFF INVOLVED IN PMTCT SERVICE DELIVERY SHOULD FILL OUT THIS SECTION	
Do you feel you are able to meet the needs of your clients?	Yes.....1 No..... 2
If not, explain	_____
Has your workload increased since the introduction of the PMTCT service?	Yes_____1 No 2
Describe any help or support you receive?	_____
Do you feel that you receive support from the hospital administration?	Yes, always/usually_____ 1 Sometimes _____ 2 Not usually/never_____ 3
What type of incentive(s) do you get for providing PMTCT services? DO NOT READ RESPONSES PROBE WITH 'ANYTHING ELSE?'CIRCLE ALL THAT APPLY	Increased salary_____1 Training_____2 Status _____3 Nothing _____4 Other(specify) 5
What are the most difficult problems you encounter in performing your job in providing PMTCT-related services? CIRCLE ALL MENTIONED. PROBE: ANYTHING ELSE?	Lack of supervision [Y] [N] Lack of feedback on job performance [Y] [N] Lack of training [Y] [N] Lack of supplies and /or stock [Y] [N] Inadequate facilities[Y] [N] Staff shortages [Y] [N] Too many patients [Y] [N] Poor working environment [Y] [N] Demoralized staff [Y] [N] Lack of time to do job [Y] [N] People don't use facility [Y] [N] Inadequate transport for patients [Y] [N] Inadequate salary [Y] [N] Others (specify)
Please indicate how you feel about each of the following statements:	Always often occasionally never
I feel emotionally drained by my work as a counselor in ANC/MCH services	1 2 3 4
My work is very stressful	1 2 3 4
My work is very rewarding	1 2 3 4
My work environment is very stressful	1 2 3 4
I learn something new in my work every day	1 2 3 4
I feel isolated in my work	1 2 3 4
I have problems communicating with my colleagues	1 2 3 4
I can help my clients	1 2 3 4
I have no confidence in my clinical skills	1 2 3 4

This is the end of the assessment. Thank you very much. We really appreciate your taking the time to respond to these very important questions.

APPENDIX V: HEALTH CARE PROVIDER KNOWLEDGE ASSESSMENT AND ATTITUDE

Discussant: PMTCT counselor

Same of the interviewer

Participant's serial number

District

Name of the facility

Location (01 -urban, 02-rural)

Type of Hospital (01-Provincial Hospital,02-District Hospital,03-Sub-District Hospital,04-Health center,05-Dispensary,06-Mission Hospital)

Instructions for interviewer

This tool should be administered to staff involved in the PMTCT intervention, as well as staff working in the MCH/ANC, maternity and postnatal ward. It should be administered face-to face, to the extent feasible, to ensure quality of responses and understanding of questions

Hello. My name is

I am here to conduct an assessment of the prevention of Mother-to-child transmission of HIV. We would like to ask you a few questions about your knowledge on MTCT. We would like to ask your opinion of the PMTCT service in general. This is not a test; there is no right or wrong answers.

I realize how limited your time is and greatly appreciate you're taking the time to speak with me. Do you have any questions for me?

/ HEALTH CARE PROVIDER KNOWLEDGE ASSESSMENT

Please circle the number (1-4) below that best represents your PMTCT training and experience.

1	2	3	4
Trained in PMTCT and providing PMTCT services	Trained in PMTCT and not providing PMTCT services	Not trained in PMTCT and working in a PMTCT facility	Not trained in PMTCT and working in a facility not providing PMTCT services

Please complete ALL of the following questions.

A. Please read each question (1-10) carefully and circle the most accurate response.	
1.	<p>What proportion of Kenyan adults is infected with HIV?</p> <p>About 14% of all adults</p> <p>About 5% of women and 9% of men</p> <p>About 5% of all adults</p> <p>About 9% of women and 5% of men</p>
2.	<p>Which body fluids transmit HIV infection?</p> <p>Semen, blood, vaginal secretions</p> <p>Semen, saliva, breast milk</p> <p>Blood, semen, tears</p> <p>Vaginal secretions, saliva, breast milk</p>
3.	<p>How do the HIV rapid tests measure HIV serostatus?</p> <p>Detecting the presence of HIV antigen</p> <p>Detecting the presence of HIV antibody</p> <p>Determining the quantity of HIV</p> <p>Detecting the presence of viral DNA</p>
	<p>The risk of mother-to-child transmission of HIV infection increases when</p> <p>Breastfeeding is continued over time</p> <p>Non-invasive delivery procedures are used</p> <p>Maternal viral load is low</p> <p>Sexually transmitted infections are treated early</p>
5.	<p>What is one advantage of using commercial infant-feeding formula?</p> <p>It provides all the nutrients and antibodies a baby may need</p> <p>It is always available</p> <p>Other family members can help feed the baby</p> <p>It carries very little risk of causing diarrhea or bacterial infections</p>
6.	<p>If two rapid HIV tests are performed and one test is positive and one test is negative</p> <p>The patient is HIV positive</p> <p>The patient is HIV negative</p> <p>The patient is in the process of seroconversion</p> <p>The patient's HIV status needs to be confirmed</p>
7.	<p>Interventions to minimize the risk of HIV transmission during breastfeeding include all of the following <i>except</i></p> <p>Teach mothers good breastfeeding technique</p> <p>Support mothers to use exclusive breastfeeding</p> <p>Instruct mothers to supplement breast milk with other milks to reduce exposure</p> <p>Encourage mothers to obtain early treatment of breast problems</p>
8.	<p>When Nevirapine is used to prevent mother-to-child transmission of HIV it should be administered</p> <p>To the mother during pregnancy</p> <p>To the mother at onset of labor and to the baby within 72 hours of birth</p> <p>To the mother immediately postpartum</p>

	To the mother during pregnancy and to the baby for 7 days	
9.	Postnatal infant-feeding counseling and follow-up are required Throughout the breastfeeding period When replacement feeding is the chosen option Whenever a mother decides to change her feeding practice At selected intervals based on clinic protocols	
»		
10.	A positive HIV antibody test in an infant born to a HIV positive woman indicates that the baby is HIV infected when it is done at or after what age? 12 months 18 months 6 months All of the above	
B.	Indicate whether the following statements (11-20) are True (T) or False (F).	
11.	HIV exposed infants should receive Cotrimoxazole preventive therapy (CPT) beginning at 6 weeks of age.	
12.	One of the most commonly seen presenting symptoms of HIV infection in children is growth faltering.	
13.	Kenya guidelines recommend exclusive breastfeeding with cessation at 6 months of age as an appropriate infant-feeding option for HIV positive women.	
14.	A woman of unknown HIV status who presents to the health care facility in early labor should be tested for HIV immediately after delivery.	
15.	HIV post-test counseling for HIV negative women does not include advice about safer sex.	
16.	Dual protection means contraceptive methods that will protect against HIV/STIs as well as protect against pregnancy.	
17.	The actions of staff in PMTCT programmes can play an important role in reducing the stigma and discrimination related to HIV.	
18.	Support for exclusive breastfeeding is not a priority in the immediate postpartum period.	
19.	A person with HIV infection may or may not have AIDS.	
20.	Kenya national guidelines do not support opt-out HIV testing in antenatal care.	

II. A TTITVDE SCORE SHEET

Instructions to the inten'iewer

A series of questions were used to elicit the respondent's attitudes towards prevention of mother to child transmission of HIV.

In the self-administered questionnaire, these questions were measured on a likert-scale with respondents circling answers ranging from strongly agree to strongly disagree. A marking scheme assigning values 1 to 5 was used to analyze the responses. Five represented a positive attitude while one represented a negative attitude over the range of 1 to 5. The questions are given here below with marks given to the responses.

The highest mark a respondent could get was 70 marks and the lowest was 14 marks. Missing answers were assigned a value of 3 or neutral. Percentage scores were calculated out of the scores each respondent will get. A percentage score of above 60% was said to have a positive attitude towards HIV/AIDS and PMTCT. A percentage score of less than or equal to 60% was said to have a negative attitude towards HIV/AIDS.

N.B 60% was chosen as the cut off percentage mark because if a respondent is neutral on all fourteen questions chosen to elicit attitudes, he/she would get a score of 3 in all ten questions. This would give a mark of 30 out of 50, which was equal to 60%.

Response	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
----------	----------------	-------	---------	----------	-------------------

	(SA)	(A)	(N)	(D)	(SD)
--	------	-----	-----	-----	------

Score	1	2	3	4	5
-------	---	---	---	---	---

1. People with HIV/AIDS are promiscuous (Have sex anyhow and with anyone)

Score	1	2	3	4	5
-------	---	---	---	---	---

2. Mothers are not at risk of acquiring HIV

Score	1	2	3	4	5
-------	---	---	---	---	---

3.1 would be willing to treat a pregnant woman or mother with HIV/AIDS?

Score	5	4	3	2	1
-------	---	---	---	---	---

4.1 would touch and interact freely with a pregnant woman or mother who has HIV/AIDS?

Score	5	4	3	2	1
-------	---	---	---	---	---

5.1 believe that condoms can protect someone from getting HIV/AIDS?

Score	5	4	3	2	1
-------	---	---	---	---	---

6.1 believe that HIV/AIDS education should be given to mothers

Score	5	4	3	2	1
-------	---	---	---	---	---

7. Mothers and pregnant women have a right to accurate and complete information concerning their sexuality with regards to there age and level of understanding

Score	5	4	3	2	1
-------	---	---	---	---	---

8. I believe mothers and pregnant women have adequate knowledge and skills to be able to protect themselves against HIV

Score 1 2 3 4 5

9. I would be willing to handle a mother or pregnant woman with HIV in the clinic

Score 5 4 3 2 1

10. An HIV positive pregnant woman will always give birth to HIV positive baby

Score 1 2 3 4 5

11. The MTCT program is a very important service for women in this clinic

Score 1 2 3 4 5

12. There is not enough time to give to the MTCT program

Score 1 2 3 4 5

13. Providing MTCT services stops us from providing good antenatal services

Score 1 2 3 4 5

14. I do not like working with women with HIV because I worry about getting infected from them

Score 1 2 3 4 5

Average attitude score

This is the end of the assessment. Thank you very much. We really appreciate your taking the time to respond to these very important questions.

APPENDIX VI: KEY INFORMANT INTERVIEW SCHEDULE

INTRODUCTION:

Guide for key informant interviews on PMTCT conducted in Kakamega District, Western Province. The key informants included laboratory -in-charges, pharmacy in-charges, facility nursing officer-in-charges, medical superintendents/Medical officers-in-charge, DASCOS and PASCO.

Section I: Socio-demographic data

Participants serial number

Sex

Age

Level of education

Name of the facility (if applicable)

Position of responsibility

Current residence.

Number of years of residence

Section II: KNOWLEDGE

What is PMTCT?

II. What are modes of HIV transmission in children?

III. What are the HIV prevention strategies for children?

IV. Have you ever seen guidelines on the prevention of HIV infection in pregnancy? If yes, where did you see them? 1. Yes 2. No

V. Do you have any copies of guidelines at your desk right now? If yes, which ones

1. Yes 2. No if yes, the copies of guidelines at my desk right now are (give titles/headings)

VI. What is the standard guideline on prevention of HIV infection in pregnancy in Kenya? (Give as much detail as possible)

VII. What are the current national PMTCT guidelines?

Probe: ARV prophylaxis

Section II: Program staff & Training

I. How many staff are available in your district?

II. How many are working in MCH/Maternity?

III. How many staff are trained in PMTCT in the district?

IV. How many of those trained in PMTCT are working in PMTCT program?

V. What drugs are commonly used for PMTCT in your district?

VI. Which HIV positive pregnant women are put on drugs for PMTCT or what criteria are used to determine that a woman should be given the drugs?

VII. For how long should the pregnant woman keep taking drugs for PMTCT?

VIII. Do you routinely counsel HIV positive clients on use of ARVs? If no, who counsels the clients on ARVs? 1. YES 2. NO specify person(s) who provides clients with ARVs

IX. Do you routinely provide HIV positive pregnant women with ARVs? If yes, who provides the clients with ARVs? (Specify person(s) who provides clients with ARVs

Place where ARVs are provided

X. Are ARVs readily available at your facility? If yes, how frequent are the shortages? 1. Yes 2. No (specify how frequently shortages occur and how long this may last)

Section III: Supervision

I. Is there a PMTCT supervision tool?

II. How frequent are the supervisory visits?

Section IV: Pharmacy support

I. Who is in charge of pharmaceuticals supply in your facility?

II. How regular is the supply of ARV drugs (Nevirapine tablets, Zidovudine tablets, Nevirapine syrup and Zidovudine syrup formulations) and related commodities (Nevirapine bottles, syringes etc)?

III. Have there been any shortages and how was it handled?

**U>P1 M)|\ \II: (UK KLIST FOR REVIEW OF INVENTORY OF
ANC/PMCTC SUPPLIES**

This **was** conducted by the research assistants together with the facility/departmental in charge in charge and /or PMTCT counselor

1 PLEASE OBSERVE IF THE FOLLOWING ITEMS EXIST ON THE DAY OF YOUR VISIT.TICK THE APPROPRIATE BOX					
1 ITEM	Yes, observed	Write quantity	in	Not available	Not provided at site
1 .Supplies for the PMTCT intervention					
ARV prophylaxis					
HIV rapid tests kits					
Rapid test kit 1					
Rapid test kit 2					
Rapid test kit 3(tie breaker)					
Lancets for rapid testing					
Infant formula					
Condoms					
IEC materials					
Supplies and equipment for PCR					
2. Other supplies					
Cotrimoxazole prophylaxis					
Disposable needles					
Clean gloves					
Disinfectant for cleaning surfaces					

PMTCT Counseling Room	YES	NO	NUMBER	COMMENTS
Is the PMTCT counseling room available?				
Is the working space adequate?				
Is the seating arrangement adequate?				
Is privacy adequate?				
Are the following IEC materials available?				
* TVs/Video				
* Radios				
^ Pamphlets				
* Other				

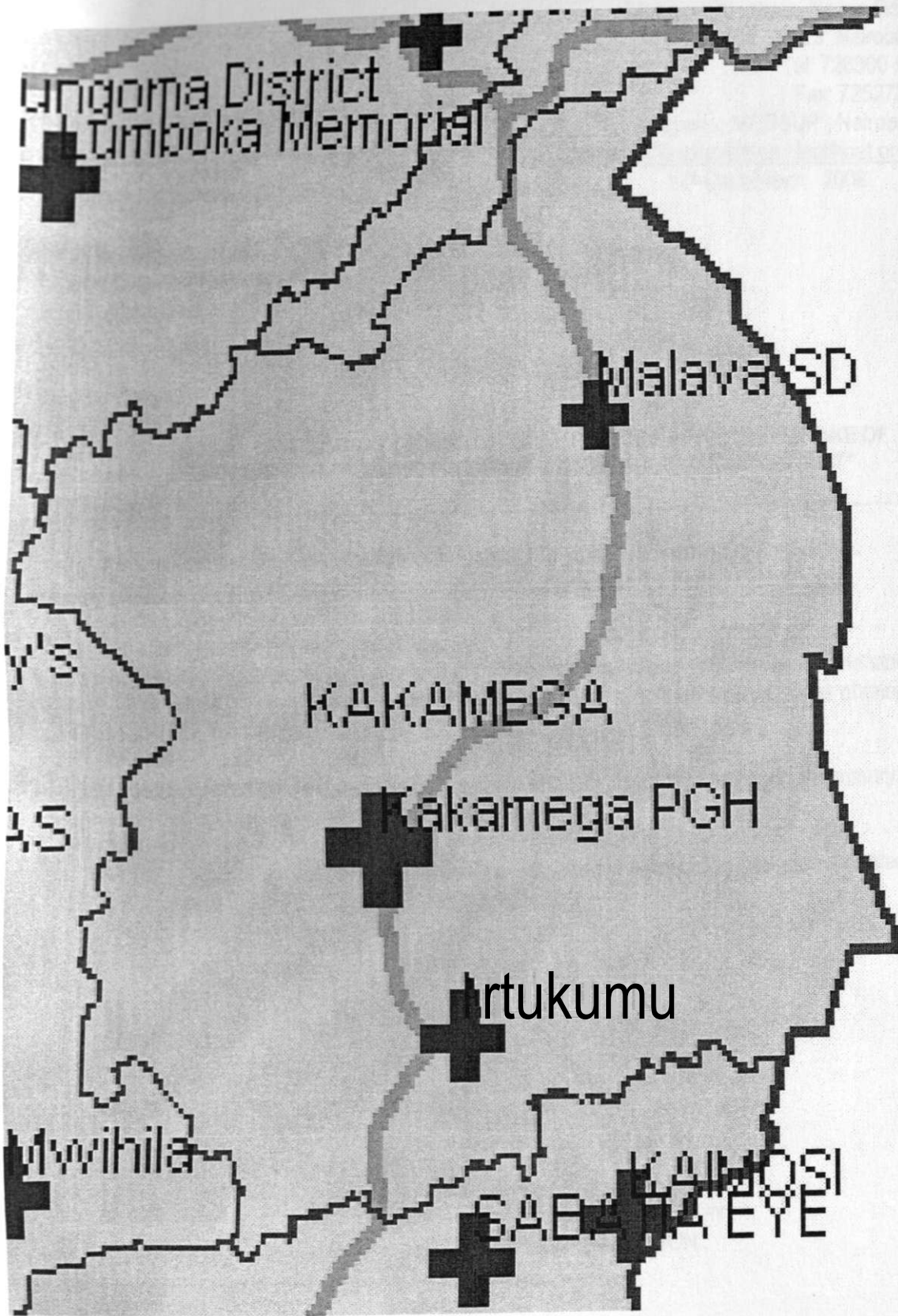
<p>I Arc the following reference materials available?</p> <ul style="list-style-type: none"> ^ PMTCT Manuals/guidelines ^ Publications ^ Posters * Pamphlets ^ Job aids ^ Journals ^ brochures •i- other 				
<p>Language for reference materials</p> <ul style="list-style-type: none"> " PMTCT Manuals/guidelines 1.English 2.Kiswahili * Publications 1.English 2.Kiswahili Posters 1. English 2.Kiswahili ^ Pamphlets 1 • English 2.Kiswahili Job aids 1.English 2.Kiswahili ^ Journals 1. English 2.Kiswahili ^ Brochures 1. English 2.Kiswahili Other 1.English 2.Kiswahili 				
MCH SECTION				
<p>General environment</p> <ul style="list-style-type: none"> General arrangement ^ Cleanliness Adequacy of furniture ^ Availability of supplies 				
<p>Records</p> <ul style="list-style-type: none"> ^ ANC registers available ^ ANC cards available 				

APPENDIX VIII: BASIC STATISTICS

This was taken at every single sampled health facilities.

1. Number of new ANC mothers in the last 3 months
2. Number received HIV counseling in the last 3 months
3. Number received HIV testing in the last 3 months
4. Number HIV positive in the last 3 months
5. Mother NVP/AZT in the last 3 months
6. Infant NVP/AZT in the last 3 months
7. Number of health workers trained in the provision of PMTCT services according to national and international standards

APPENDIX VIII: MAP OF KAKAMEGA DISTRICT





KENYATTA NATIONAL HOSPITAL

Hospital Rd along, Ngong Rd.

P.O. Box 20723, Nairobi.

Tel: 726300-9

Fax: 725272

Telegrams: MEDSUP", Nairobi.

Email: KNHplan@Ken.Healthnet.org

17th December 2008

Ref: KNH/UON-ERC/A/127

Dr. Maxwell Philip Omondi
Dept. of Community Health
School of Medicine
University of Nairobi

Dear Dr. Omondi

**RESEARCH PROPOSAL: "ASSESSMENT OF INSTITUTIONAL FACTORS AFFECTING UPTAKE OF
ARV PROPHYLAXIS AMONGST HIV POSITIVE PREGNANT WOMEN IN KAKAMEGA DISTRICT"
(P289/11/2008)**

This is to inform you that the Kenyatta National Hospital Ethics and Research Committee has reviewed and **approved** your above cited revised research proposal for the period 17th December 2008 - 16th December 2009.

You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given. Clearance for export of biological specimen must also be obtained from KNH-ERC for each batch.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely

**PROR A N GUANTAI
SECRETARY, KNH/UON-ERC**

c.c. Prof. K.M. Bhatt, Chairperson, KNH-ERC
The Deputy Director CS, KNH
The Dean, School of Medicine, UON
The Chairman, Dept. of Community Health, UON
Supervisors: Prof. Elizabeth Ngugi, Dept. of Community Health, UON
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